

# THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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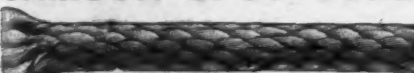
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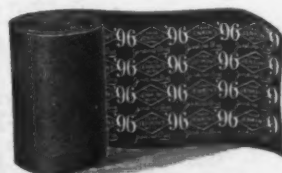
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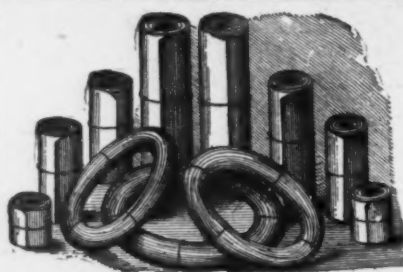
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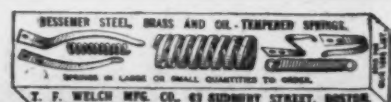
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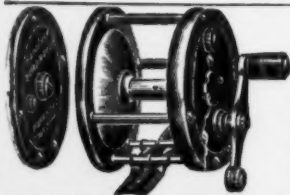
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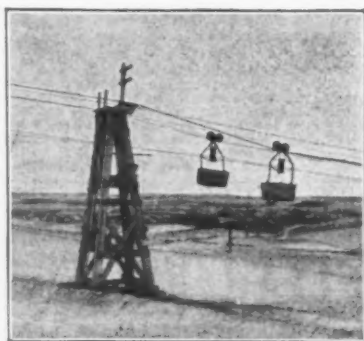
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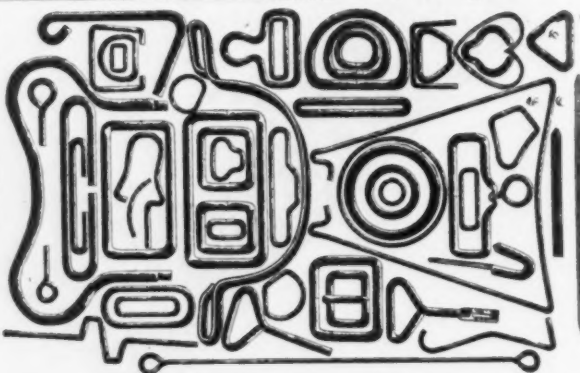
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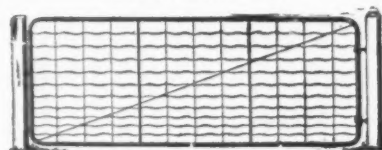
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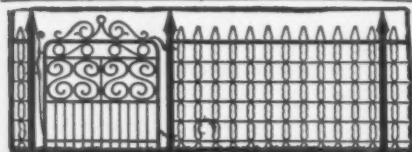
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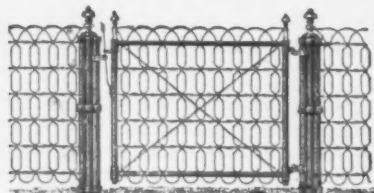


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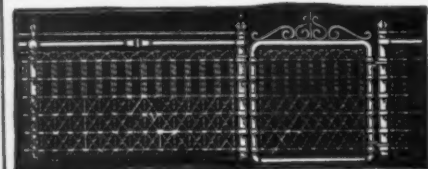
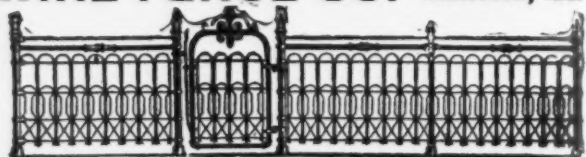
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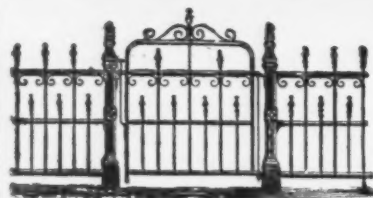
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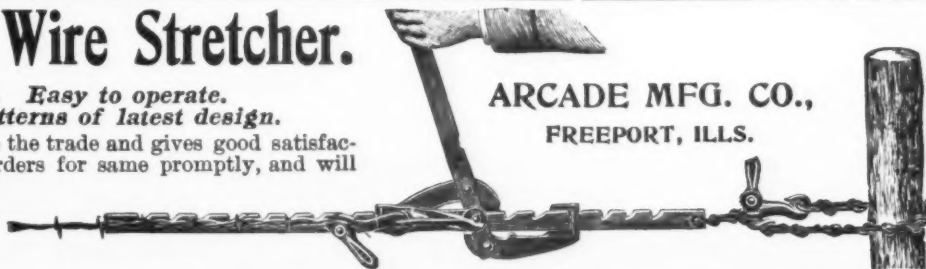
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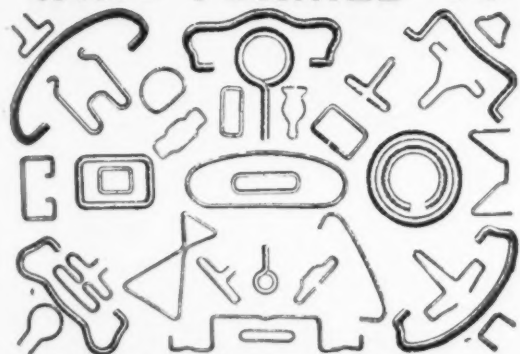
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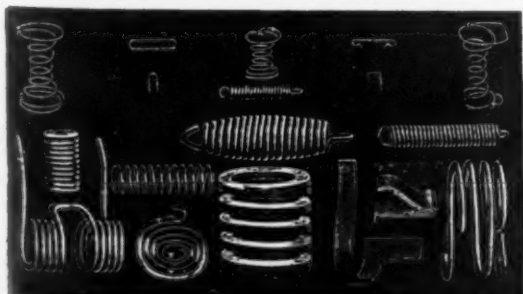
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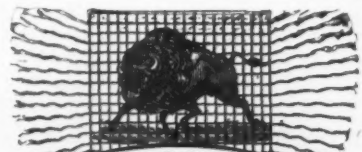
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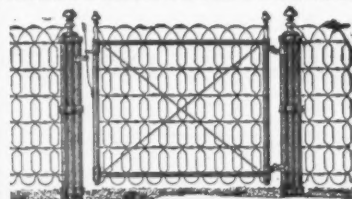
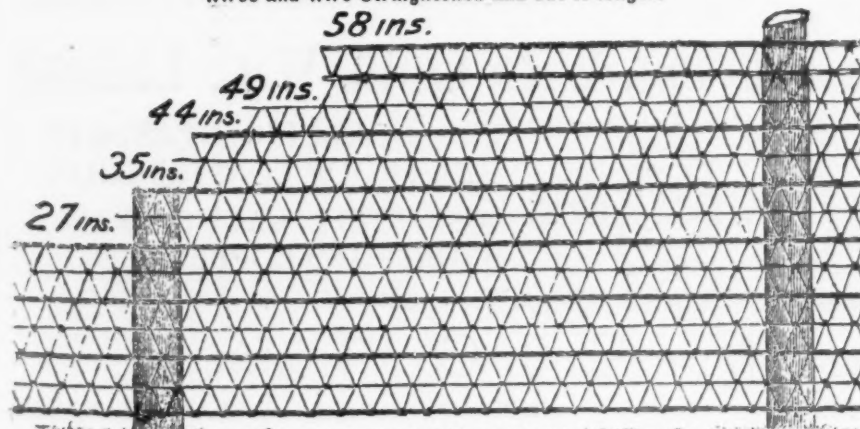
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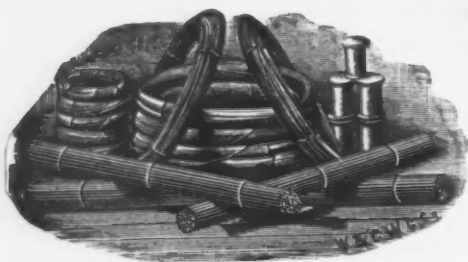
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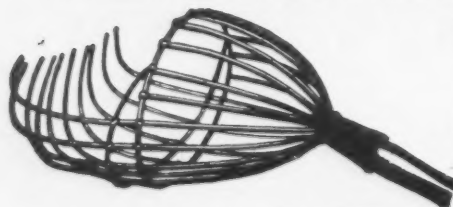
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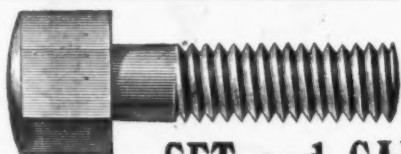
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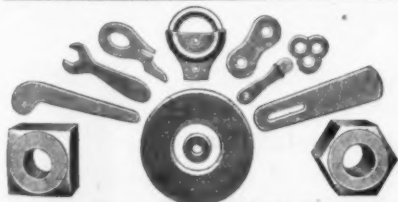
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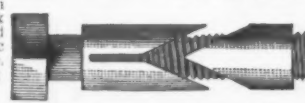


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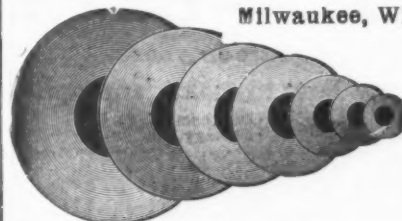
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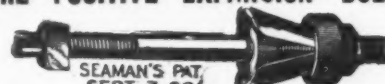
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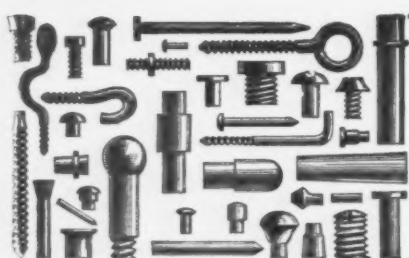
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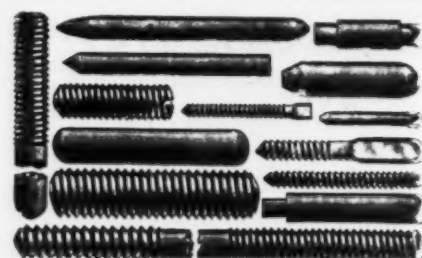


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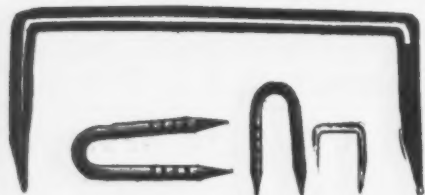
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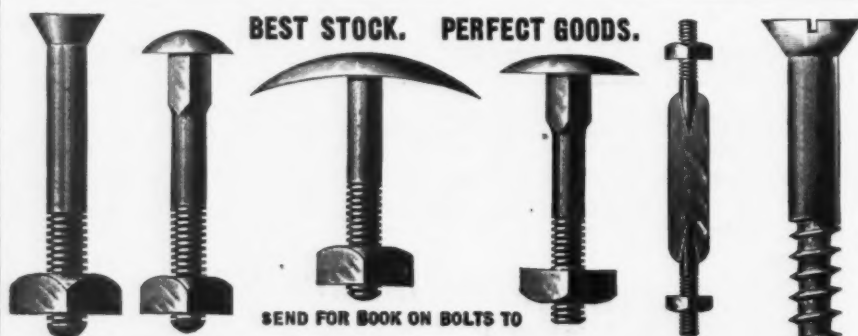
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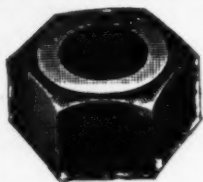
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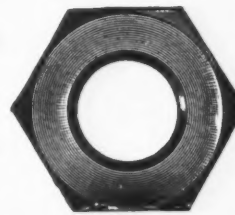
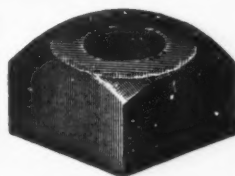
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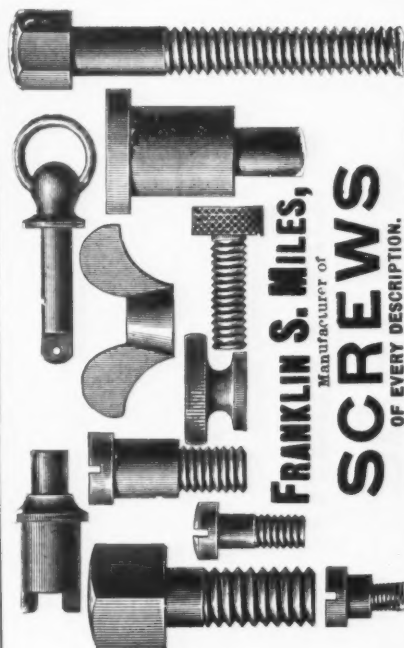


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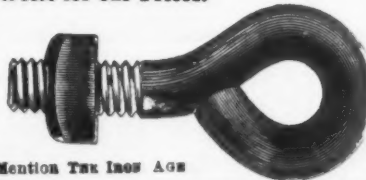
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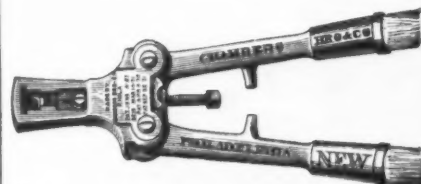


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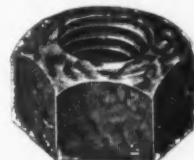
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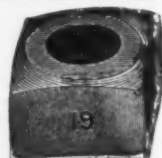
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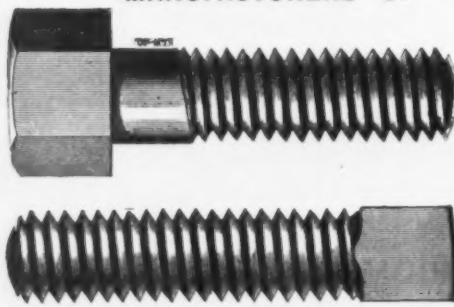
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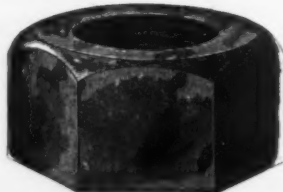
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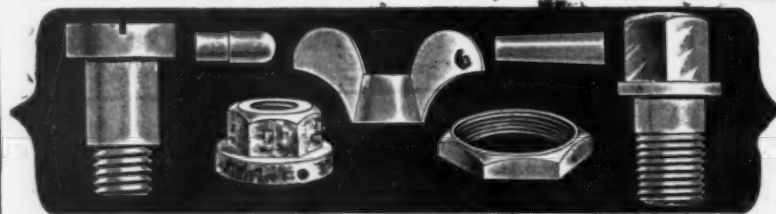
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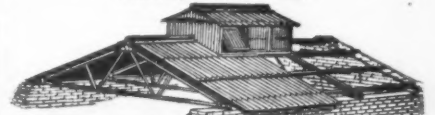
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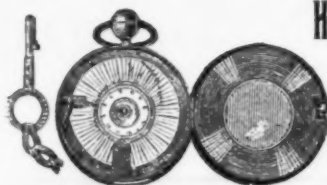
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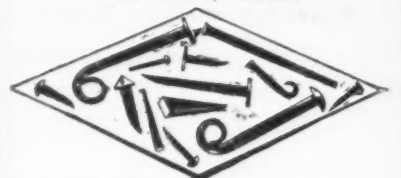
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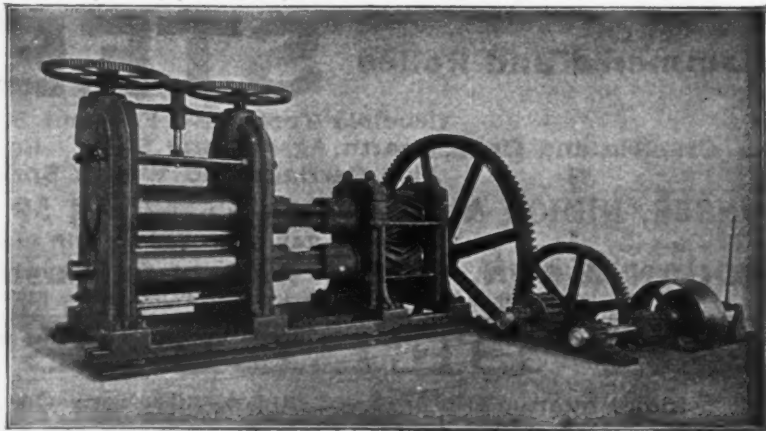
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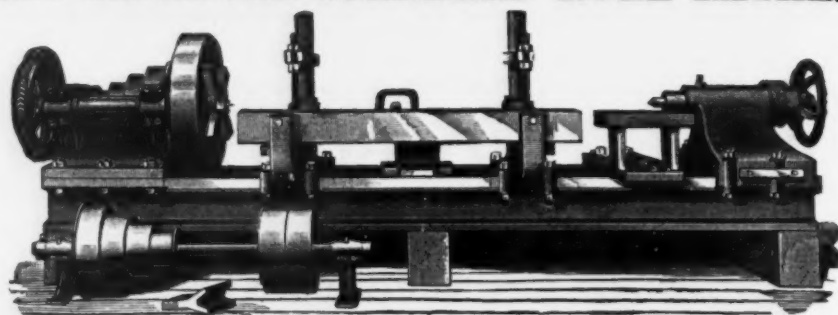
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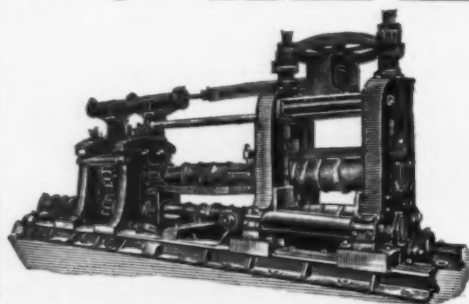
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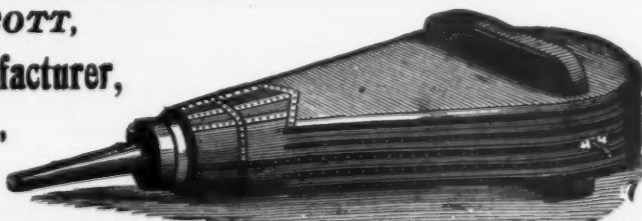
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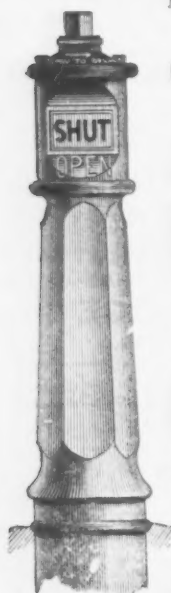
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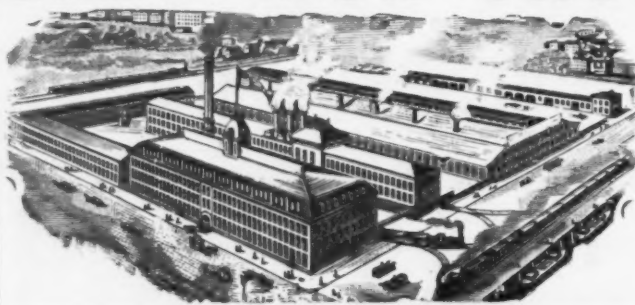
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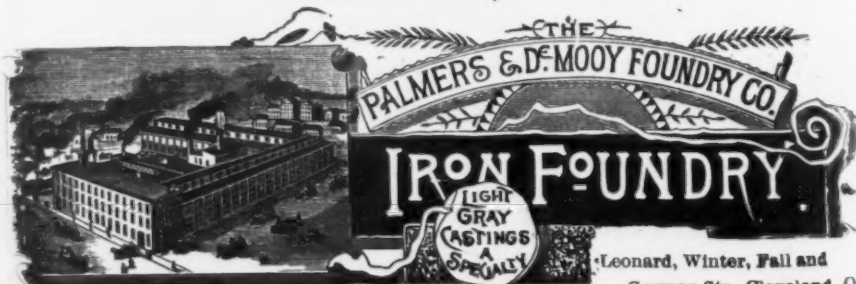
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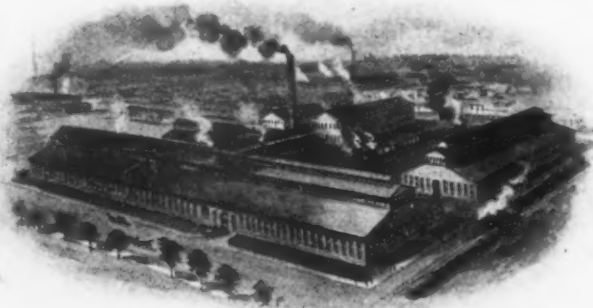
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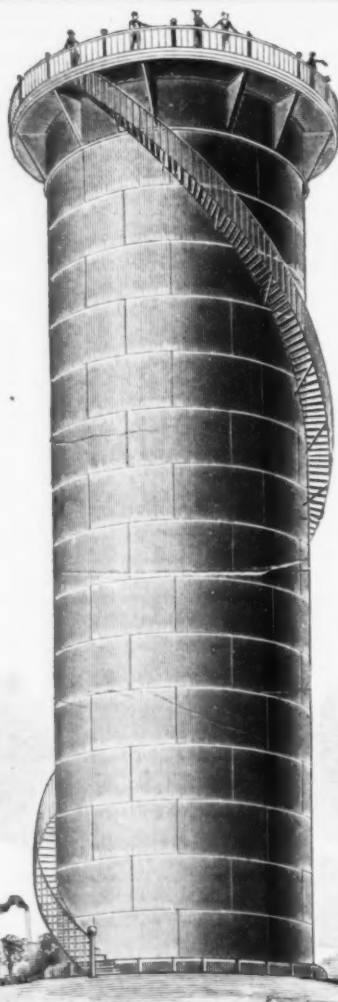
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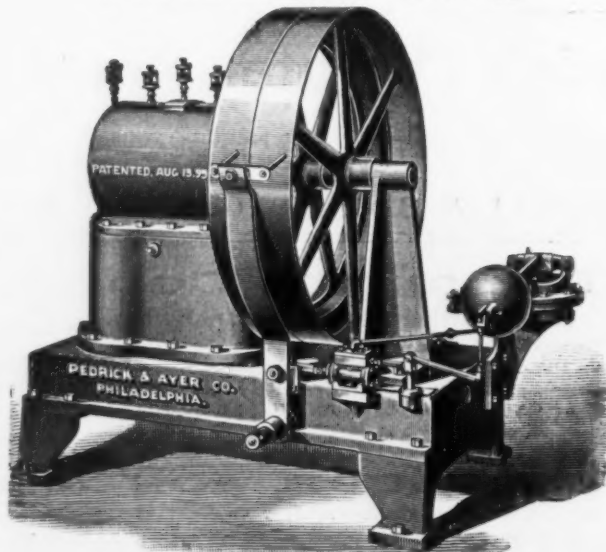
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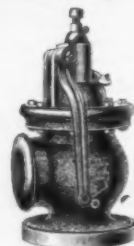


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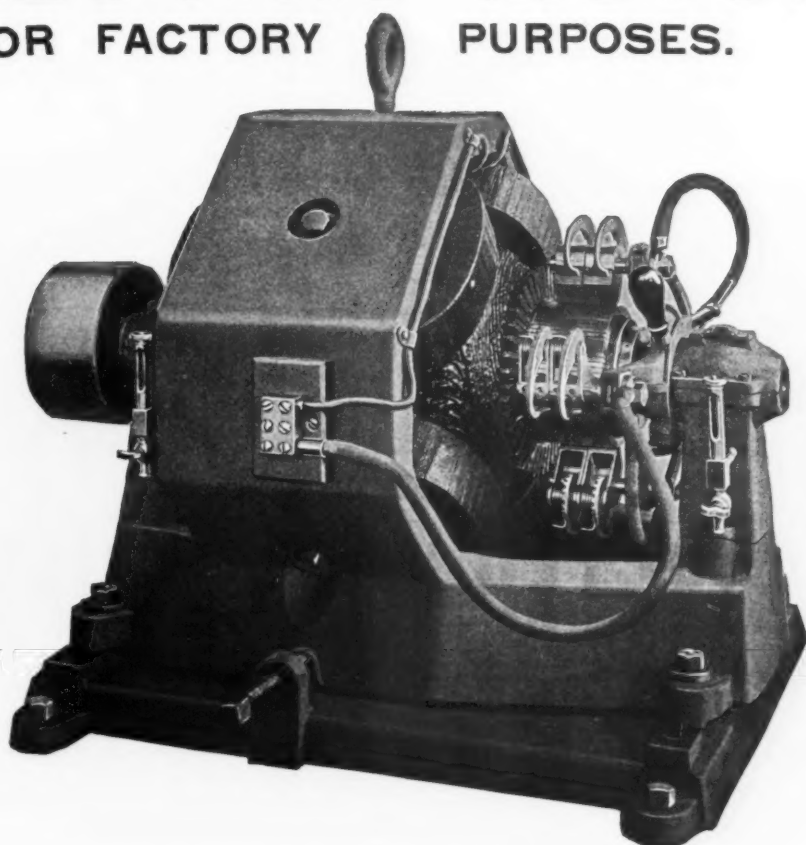


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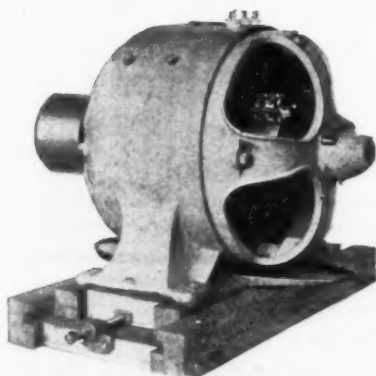
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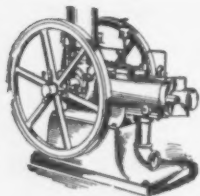
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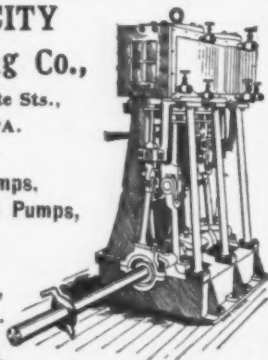
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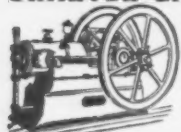
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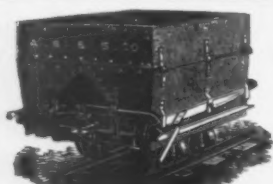
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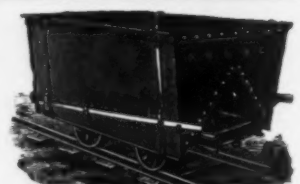


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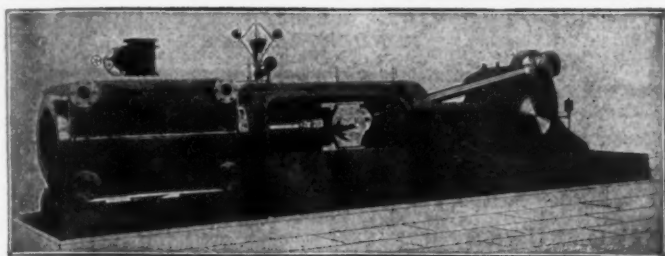
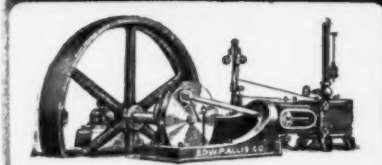
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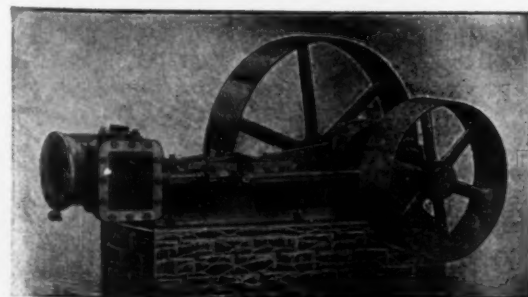
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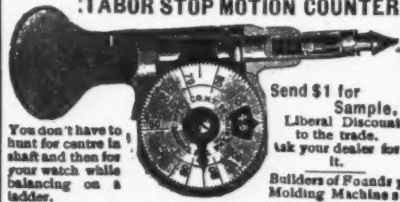


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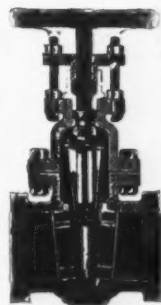
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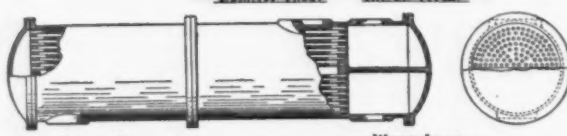
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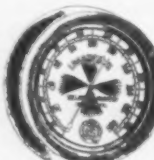
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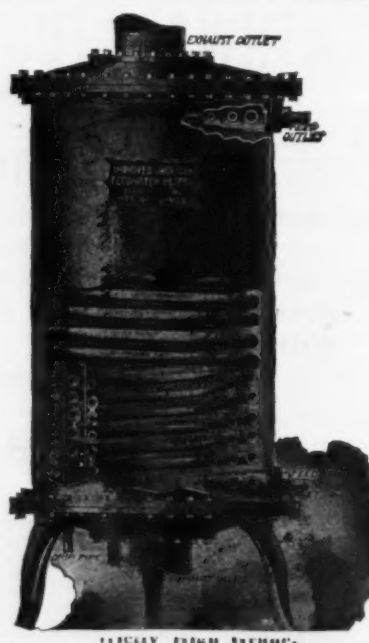
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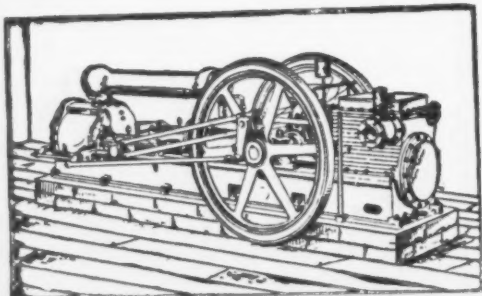
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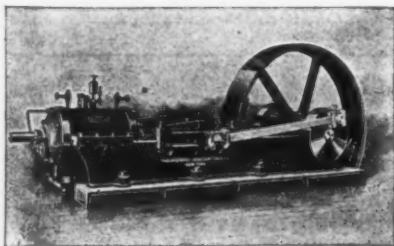
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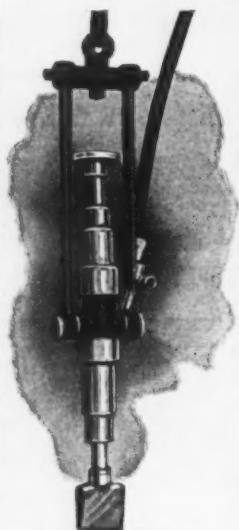
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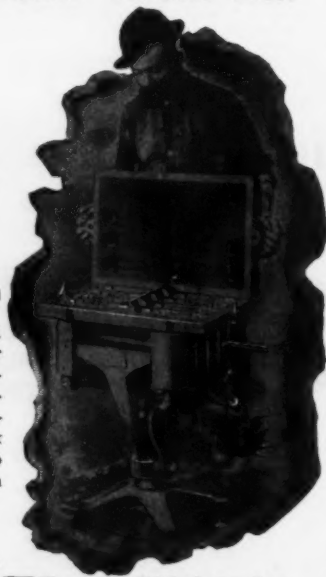
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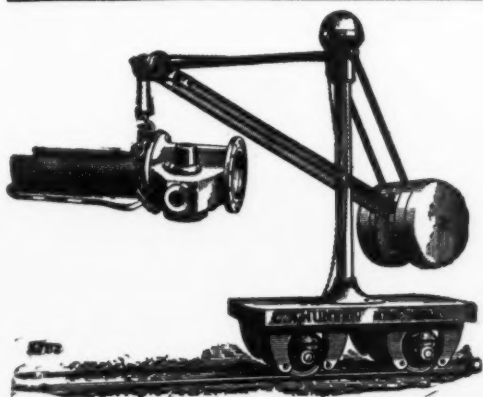
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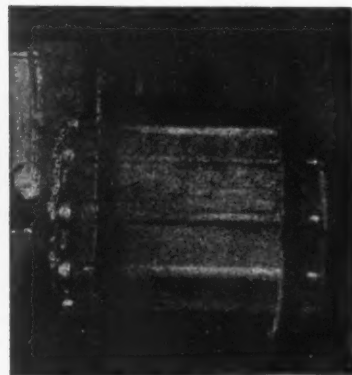
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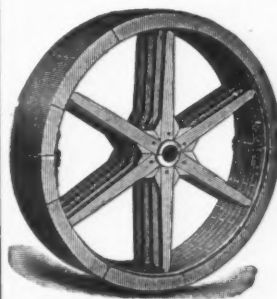
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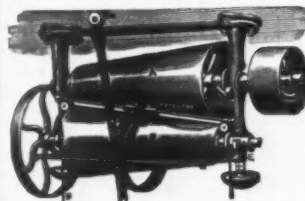
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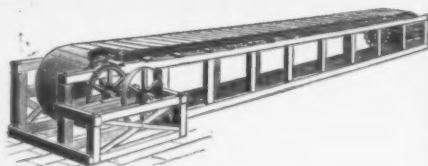
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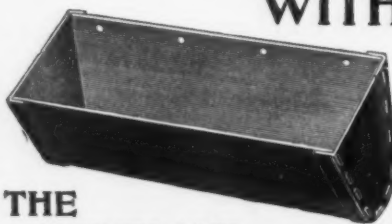
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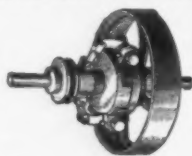
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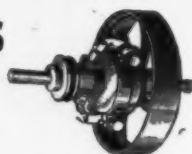
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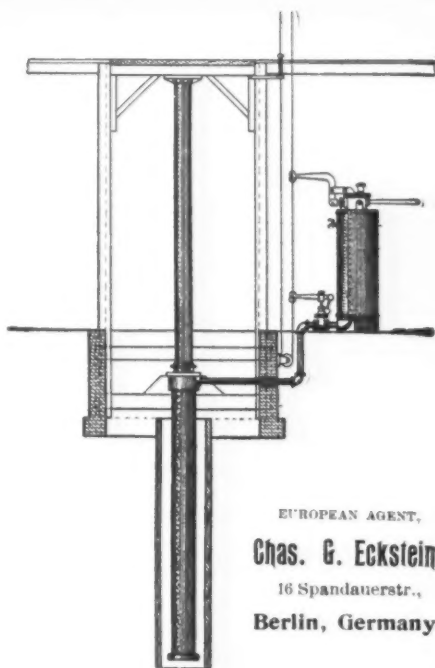
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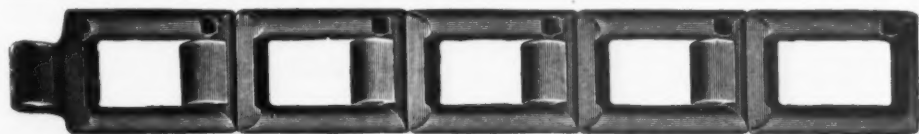
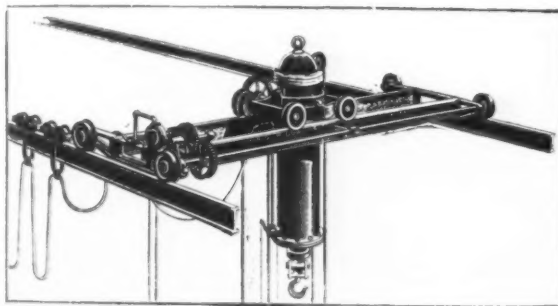
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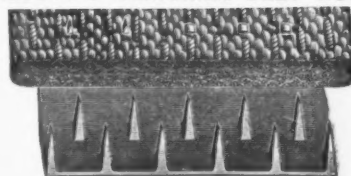
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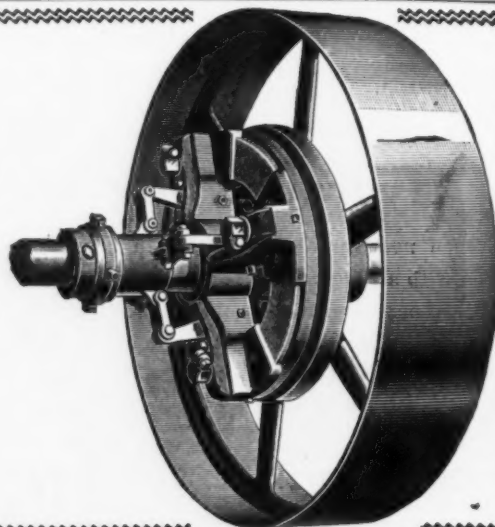
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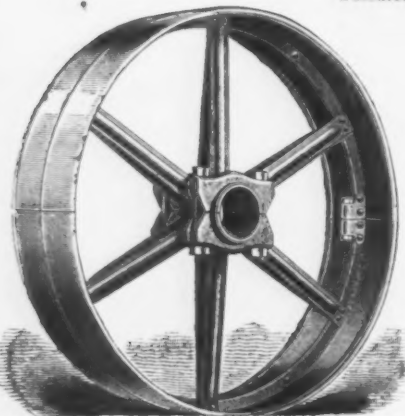
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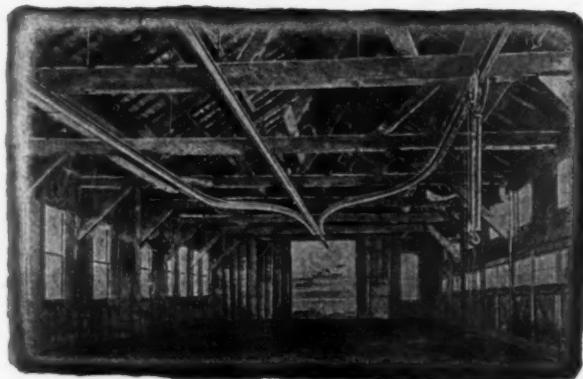
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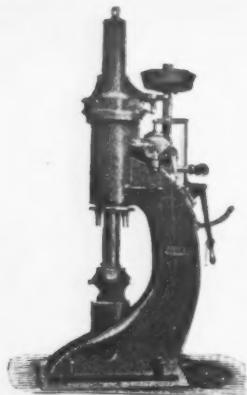
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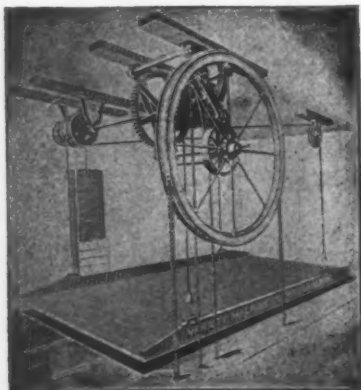
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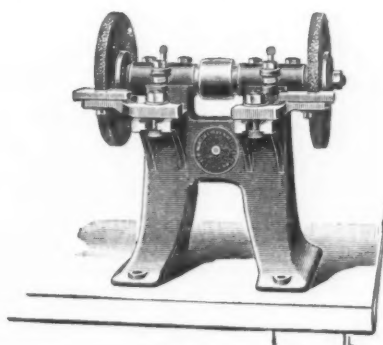
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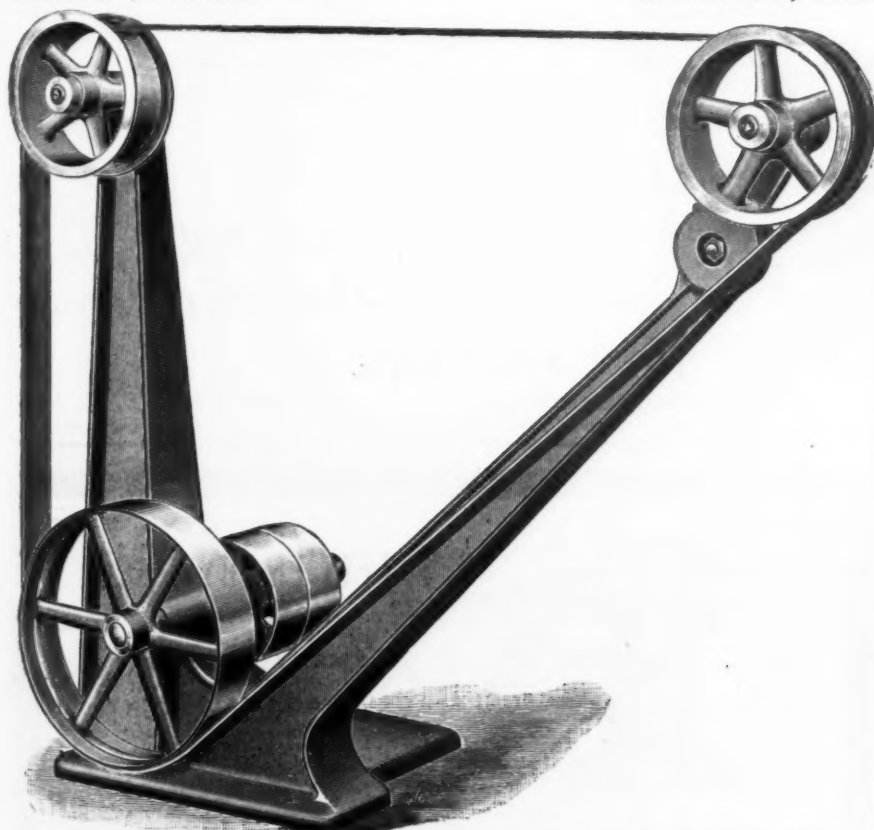
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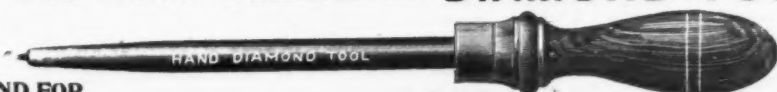
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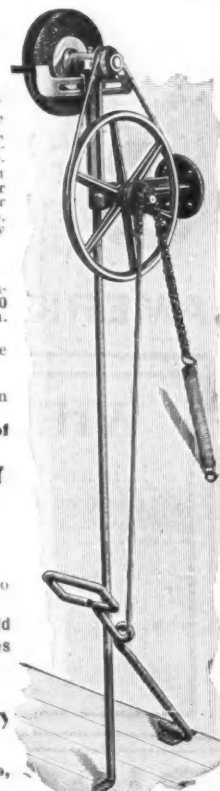
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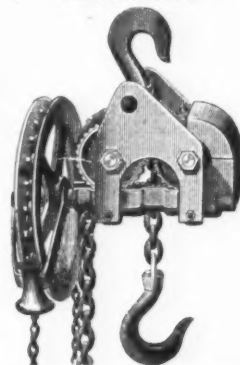
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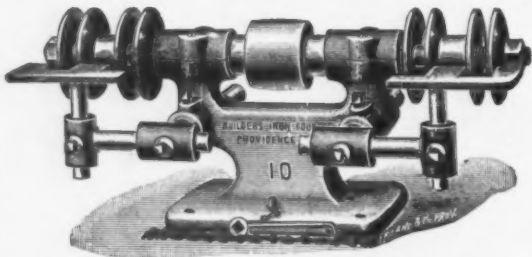
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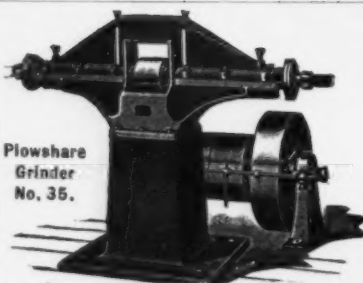
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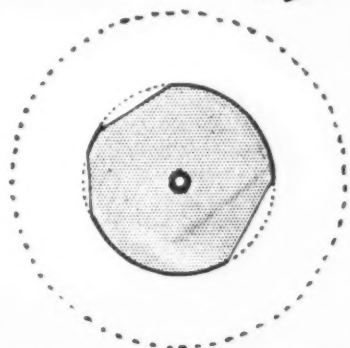
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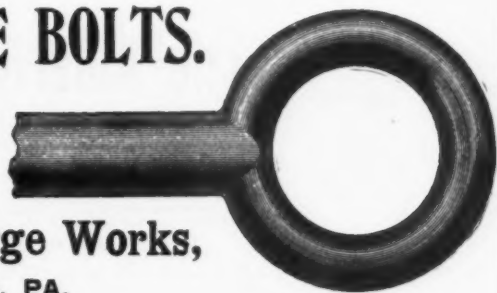
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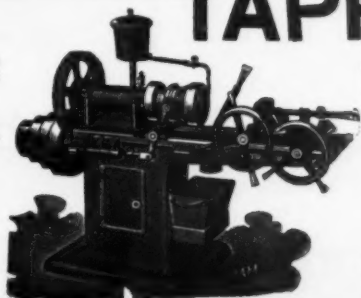
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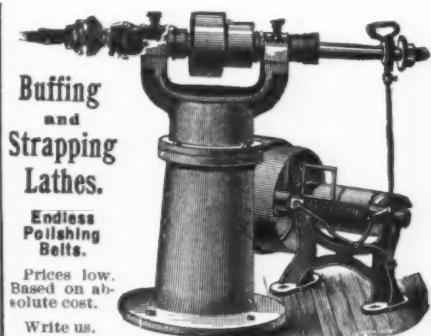
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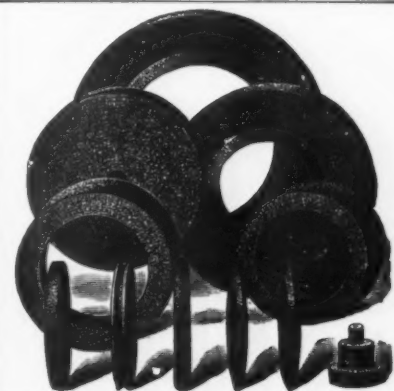
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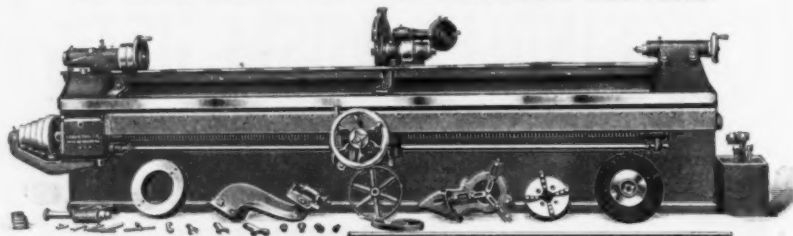
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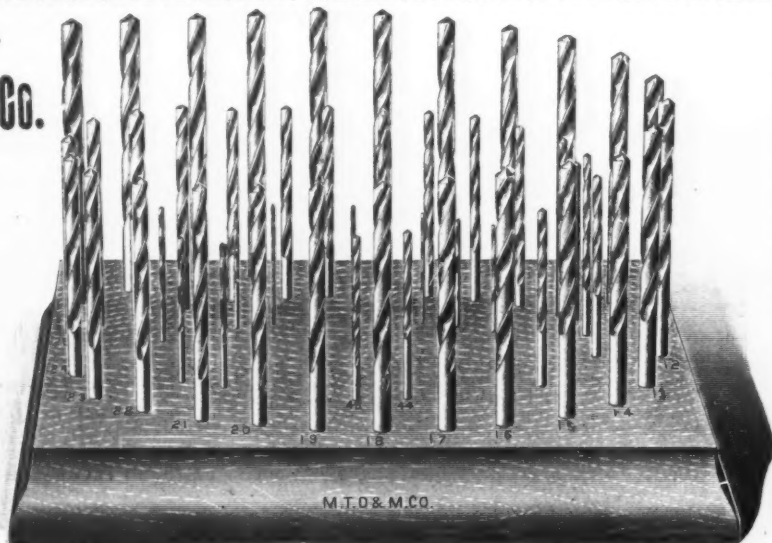
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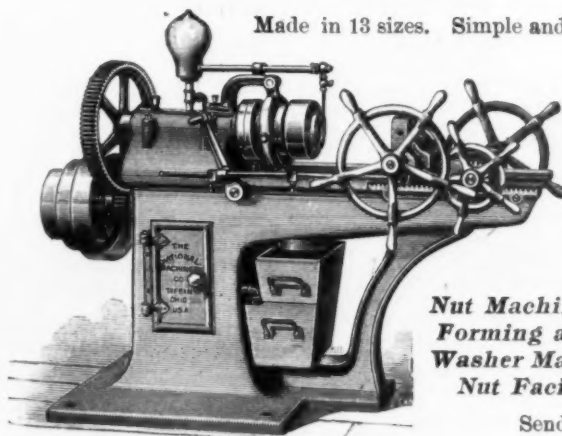
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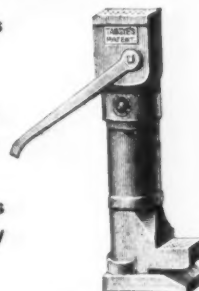
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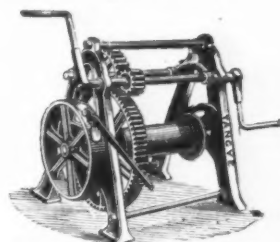
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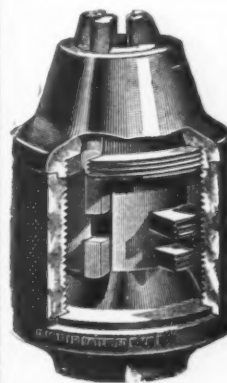
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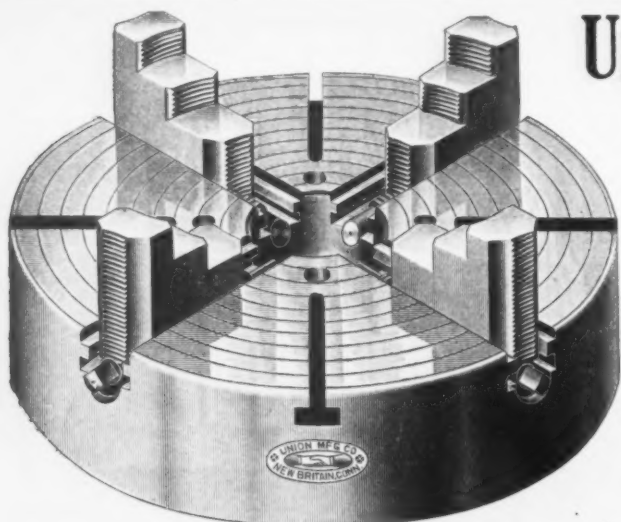


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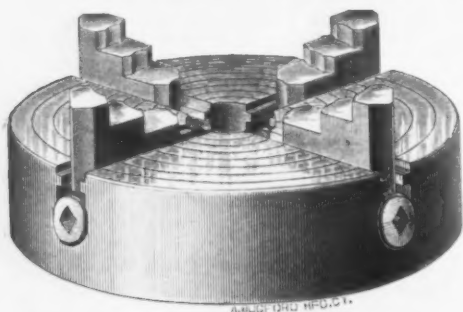
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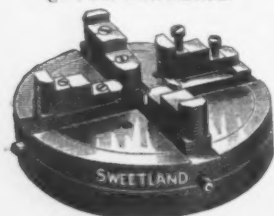
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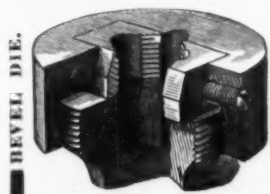
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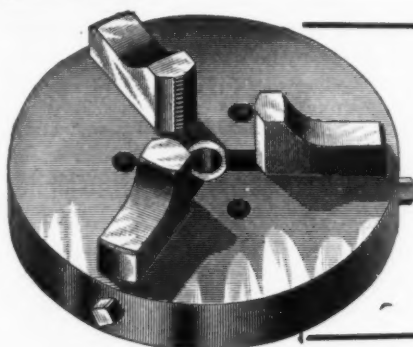
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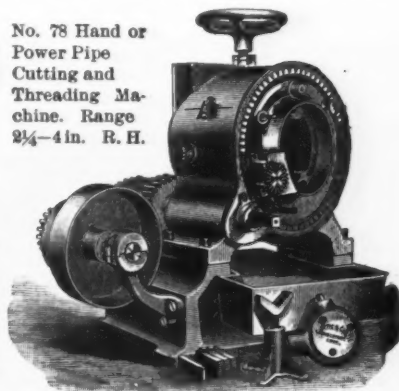
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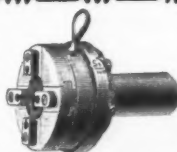
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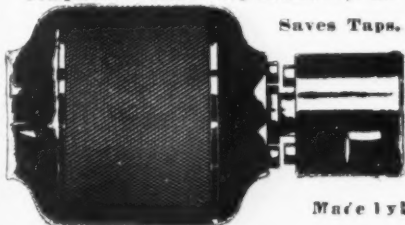
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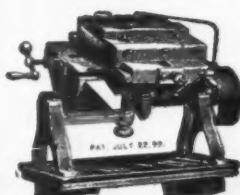


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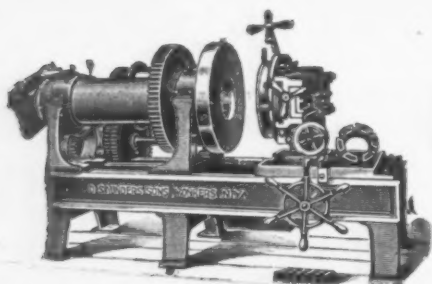


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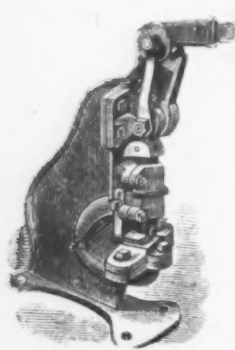
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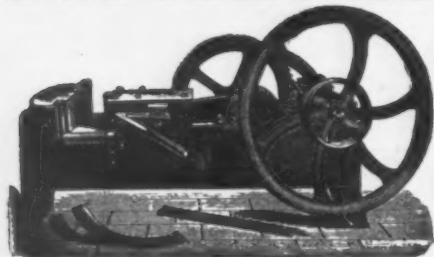
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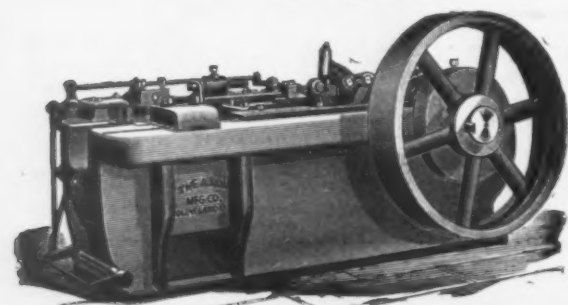
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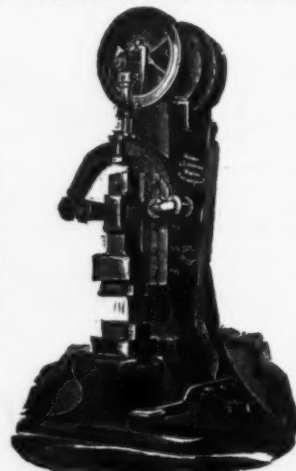
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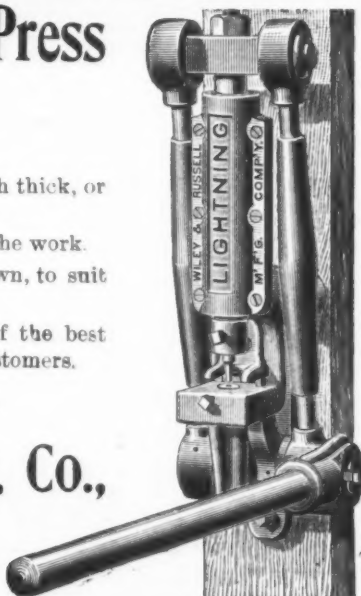
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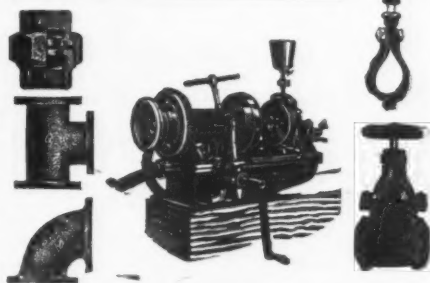


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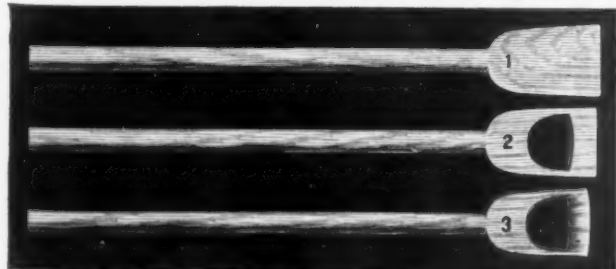
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We make name plates for some of the largest makers of machinery in the U. S. and we would be pleased to send you sample and quote price.

No Plate Too Large or Too Small.

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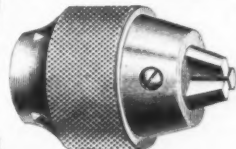


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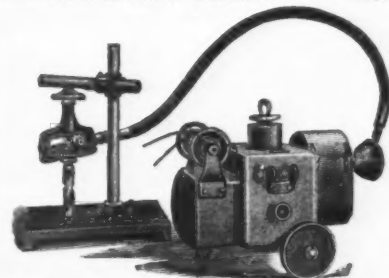
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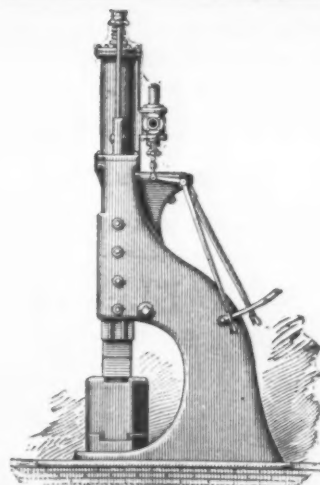
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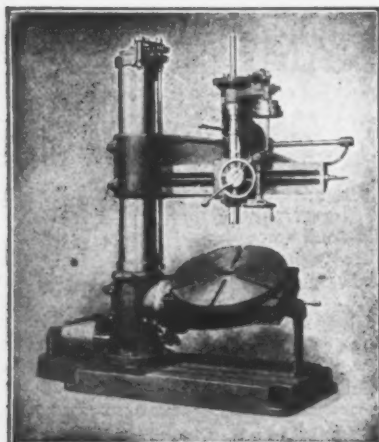
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STEAM HAMMERS OF EVERY DESCRIPTION.

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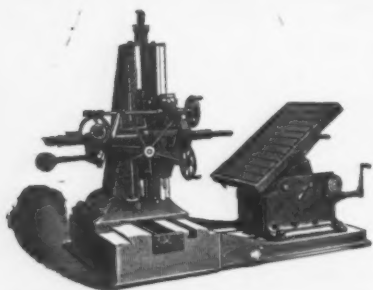


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Punches.  
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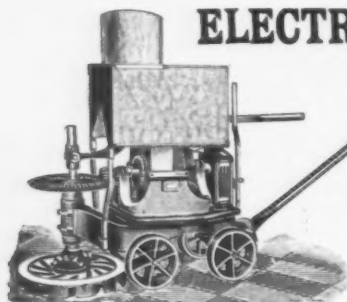
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For Smoothing Marble and Mosaic Floors.

For sanding wood floors, also useful for grinding  
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All kinds of stone working and handling machin-  
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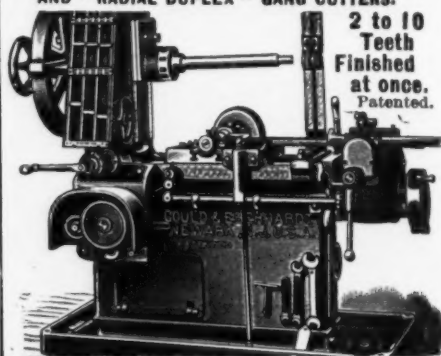
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2 to 10  
Teeth  
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**TO DRILL HOLES.**

**\$6 to \$85.**

3 sizes "Advance" Drills, Nos. 12, 13  
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19-inch Power Post  
Drill, has Cut Gears  
and is Made Well. 20-  
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or Screw Feed.

FOR USE IN

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for light work, one or more spindles,  
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Lancaster Shrinker.

Columbian Bender.

48-inch wheel Crank Blower



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Drills, all sizes and prices.

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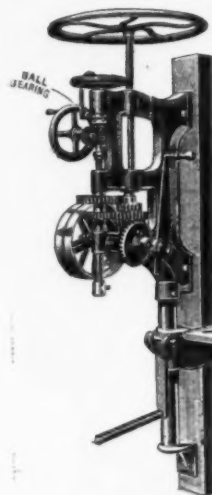
Screwplates 1/2 to 1 1/2 inch in size.

Improved Tire Benders, all sizes.

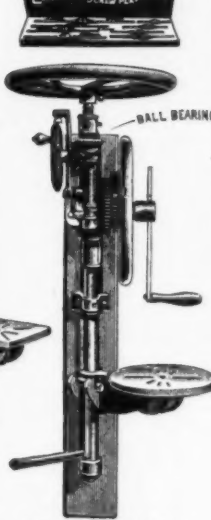
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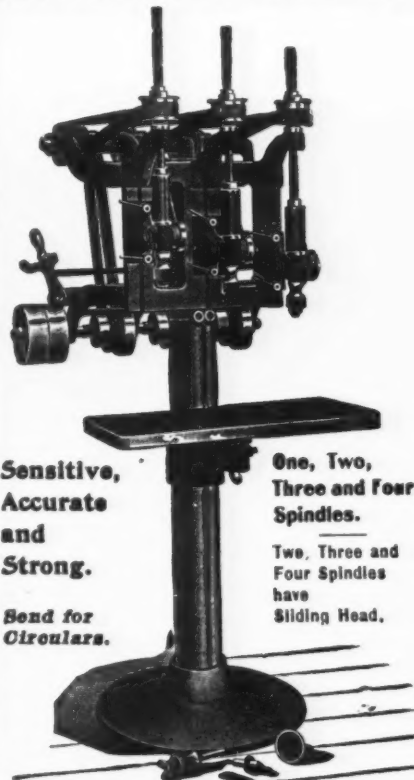


Black Diamond Drill.



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One, Two, Three and Four Spindles.

Two, Three and Four Spindles have Sliding Head.

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Special Iron, Wire and Wood Working Machinery

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## New 24, 26 and 28 inch DRILL,



with back gears, self-feed, quick return, automatic stop, graduated quill and reverse motion.

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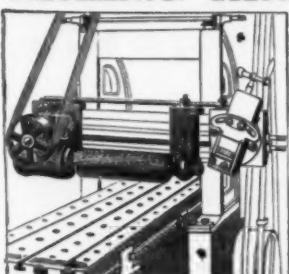
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Swivels from horizontal to vertical. Do not plane surfaces that should be milled, or mill surfaces that should be planed.

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possess *all* the good features other hammers have and *many* good features other hammers haven't.

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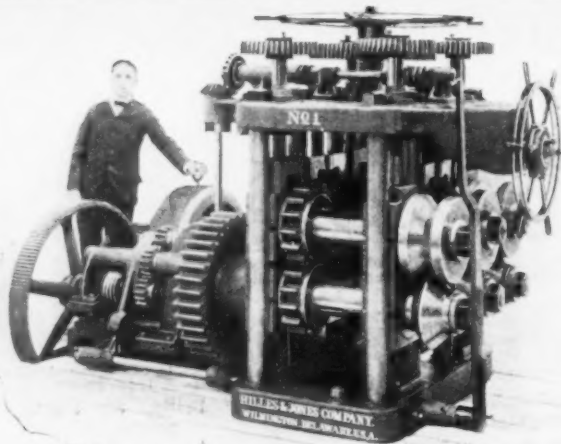
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FIVE OPERATIONS,  
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Saving 50%  
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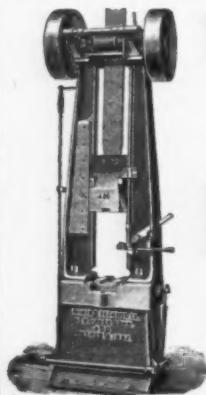


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FINGERS  
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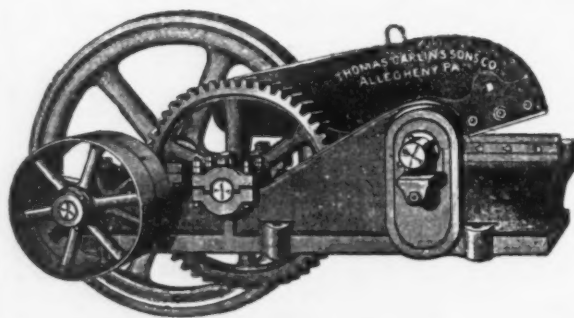


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Manufacturers of

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From 10 to 30 inch swins.

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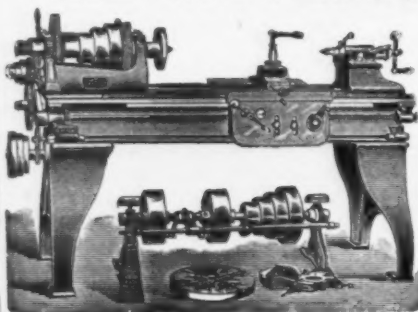
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**Keyseating and Cutting-off Machines.**

ROCHESTER, N. Y., U. S. A.

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14 Inch Engine Lathes.

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FAN AND PRESSURE BLOWERS,  
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Will send our fans to compete with any other manufacturer,  
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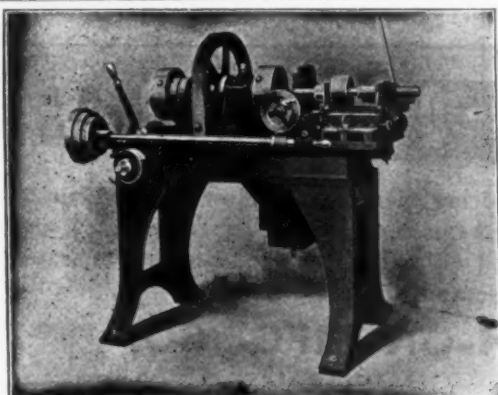
will move a larger volume of air with less power required and are lower  
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to do all we claim and will send one on trial to any responsible party.

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EXETER MACHINE WORKS,

EXETER, N. H.

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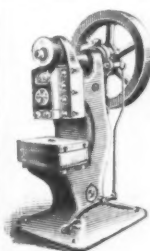
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2 in. Accelerated Speed Machine.



## Tools FOR Sheet Metal Workers.

Tinners' Tools and Machines,  
Presses and Dies,  
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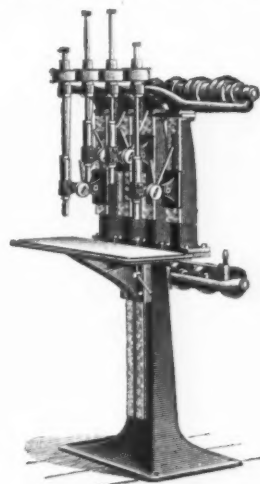
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Niagara Machine and Tool Works,

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## MULTIPLE SPINDLE Sensitive Drill.



2, 3, 4 and 6 Spindles

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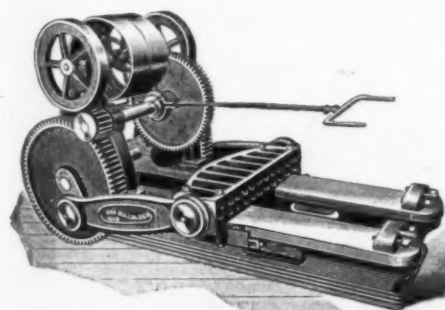
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MANUFACTURERS,

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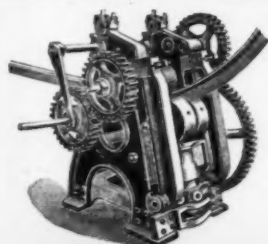


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TRADE MARK

Justice Dead Stroke Hammers,  
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## When You Buy a Bending Machine

you want the best—one that will admit of the  
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and accurate work. Such is the Bethlehem  
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Bethlehem Foundry & Machine Company,  
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NEW DESIGN, POWER-  
FUL, YET SENSITIVE  
TO THE LIGHTEST  
TOUCH. ANVIL AND  
HEAD CAST STEEL  
SUFFICIENTLY LARGE  
TO OBVIATE BREAK-  
AGE. BABBITT METAL  
BEARINGS. EXCLU-  
SIVE OF DIES.  
WEIGHS 735 POUNDS.  
THE BEST HAMMER  
EVER OFFERED FOR  
THE PRICE. WRITE FOR  
PARTICULARS.

THE  
HILBERT-FREIBERG  
MCH TOOL CO.,  
Cincinnati, O.



WILSON  
IMPROVED IRON  
PLANERS.  
STANDARD SIZES & W.A. WILSON  
KEPT IN STOCK. RIVER ST. ROCHESTER, N.Y.



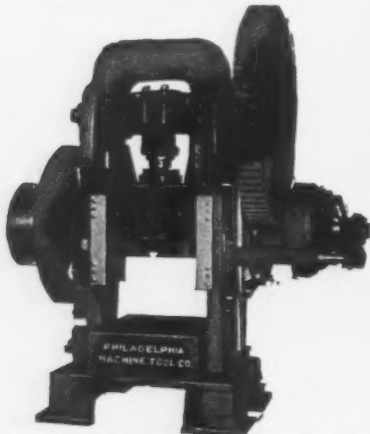


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Dry Kilns, etc. Correspond-  
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No. 5 Straight Sided Press with Side  
Cutter.

Presses, Shears, &c.,  
Testing Machines,  
Special Machines.

## Beaudry Champion Power Hammer.



**BEYOND COMPARISON.**

Simplest, Best Design.  
Most Efficient and Durable.

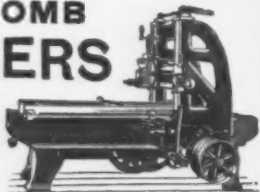
SEND FOR CIRCULAR.

**Beaudry & Co.,** 6 Oliver St.,  
Boston, Mass.,  
U. S. A.

## WHITCOMB PLANERS

Send for Price.

**WHITCOMB  
MFG. CO.,**  
Worcester, Mass.



# "STAR" TAPPING ATTACHMENT

## 60 Hours to 3 Hours

represents the difference in time between tapping holes by hand and using a "Star" Tapping Attachment on a small job by one of our recent customers. A larger job would show even a greater difference—You are not obliged to use the "Star" Tapping Attachment every hour to make it pay. The "Star" Tapping Attachment is suitable for Drilling, Tapping and Stud Setting. Automatic. Fits any Drill Press. No Reverse Belts required. Friction and Positive Drive. Chuck securely holds any drill, tap, etc.

No. 1 Taps 1-16 to 5-8 inch.  
No. 2 Taps 1-16 to 1 inch.

Fully guaranteed. Sent on 30 days trial.

Circular "D" tells all about the "Star" Tapping Attachment. Shall we send it?

**Seneca Falls Mfg Co.**  
255 Water Street  
Seneca Falls, N. Y., U. S. A.

CHARLES AUSTIN BATES N. Y.

## SMOOTH-ON CASTINGS.

An iron cement for repairing blemishes or blowholes in iron or steel castings. When hard this cement has the same color and appearance as cast iron and will withstand a red heat, steam, water or oil. Write for catalogue and prices.

## SMOOTH-ON MFG. CO.,

549-551 Communipaw Avenue, - - - JERSEY CITY, N. J.  
VANCELAND TOMPKINS, Chemist.

## Work Like This can be done at considerable saving in cost

On "The Cincinnati," because it is a machine of superior strength. The weight is properly distributed, all parts rigid, with an unusually large area of slide surface. V Bearings at an angle of 45 degrees. Bearing of knee on column runs up to top of cross slide on knee. Unequaled spindle and feed power.

"The Cincinnati" stands for strength. A number of shafts can be splined at one time by clamping them as shown in illustration.

A vise, V, large enough to take in the four shafts, S, S, S, S, is clamped to the milling machine table. The four cutters are placed on the arbor at the proper distances from each other. The overhanging arm braces, B, B, combine the outer support of arbor with the knee.

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**THE  
CINCINNATI MILLING  
MACHINE CO.,**  
Cincinnati, O., U. S. A.

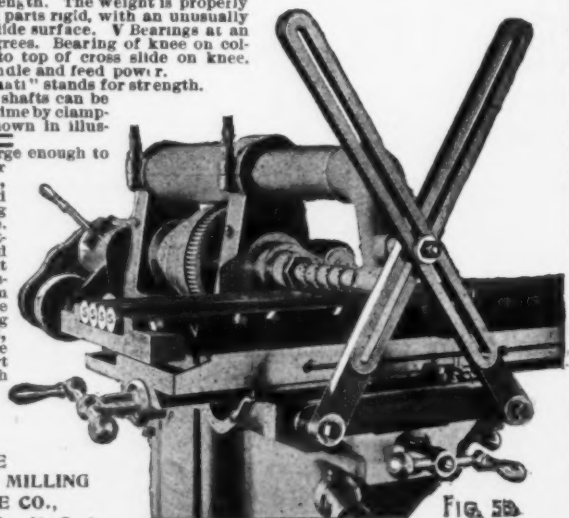
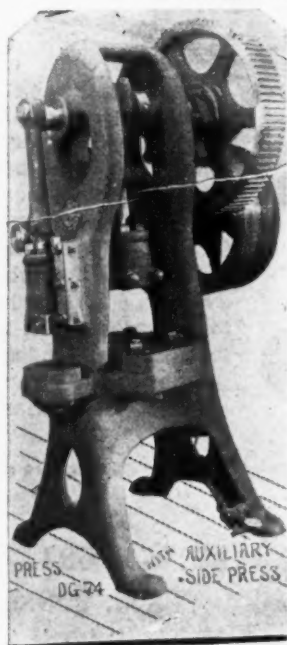


FIG. 5B

# Ferracute Machine Company,

Bridgeton, New Jersey, U. S. A.



## Presses and Dies for Sheet Metal Work,

Punching, Shearing, Cutting, Embossing, Coining and Drawing Presses.

WRITE FOR NEW CATALOGUE.

Have three Exhibits of Presses, Dies and other Sheet Metal Machinery at

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Main Exhibit, Block 8, American Machinery Department, Champ de Mars.

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Heavy Machinery in Block 5, Machinery Annex, Vincennes.

You are cordially invited to visit these exhibits.

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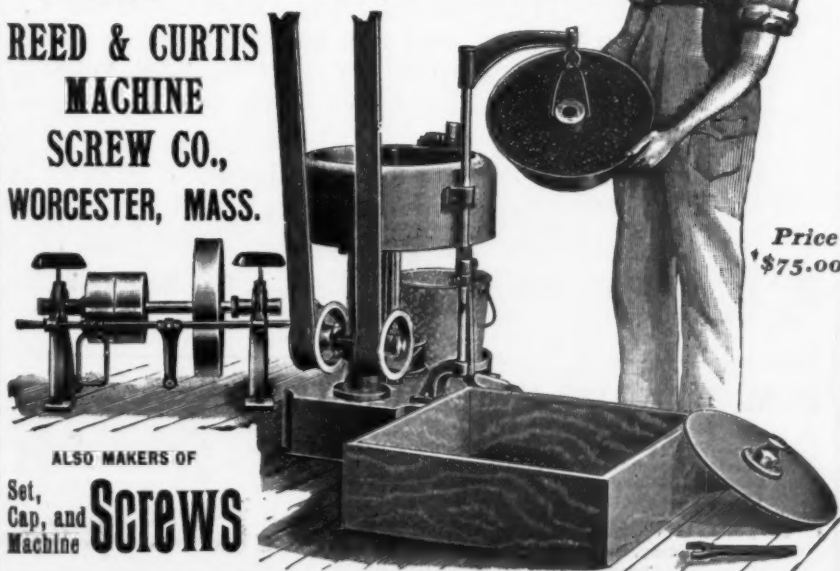
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THE BARKER & CHARD MACHINE TOOL CO.,  
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## Our OIL EXTRACTORS

will pay for themselves in oil saved.  
30 days' trial. Send for catalogue.

REED & CURTIS  
MACHINE  
SCREW CO.,  
WORCESTER, MASS.



ALSO MAKERS OF

Set,  
Cap, and  
Machine **Screws**

# Bradley

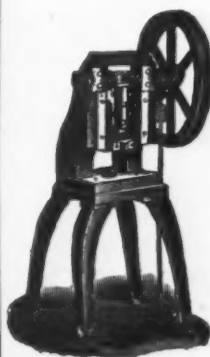


## Hammers.

Guaranteed to produce 25% more work  
with less cost for power and repairs than  
any other make of power hammers in the  
world. Send for circulars.

THE BRADLEY COMPANY,  
SYRACUSE, N. Y.

FOREIGN AGENTS:  
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Brussels, Stockholm, St. Petersburg.  
Buck & Hickman, Whitechapel Road, London.  
Montgomery & Co., 23 Boulevard Magenta, Paris.



A. H. MERRIMAN

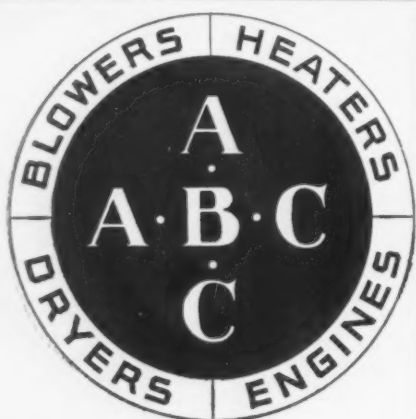
MERIDEN, CONN.

Manufacturer of all Descriptions of

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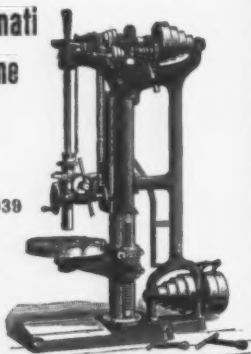
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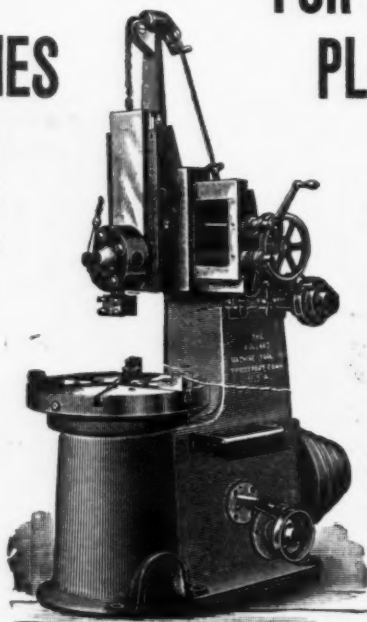
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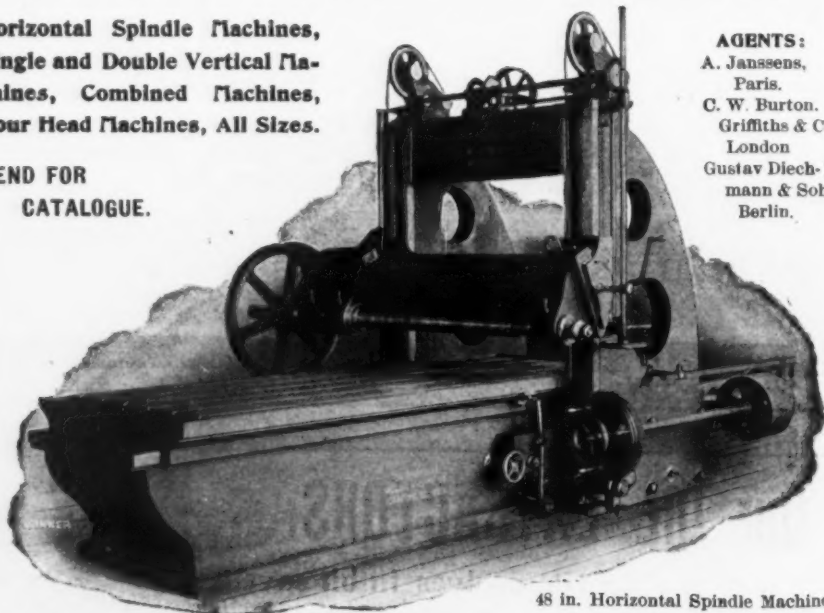
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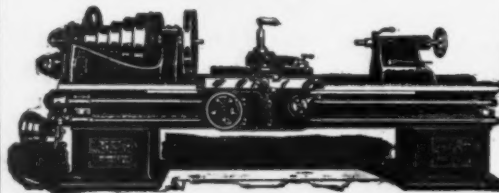
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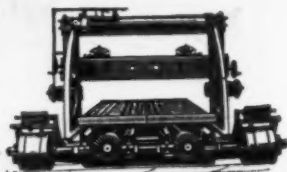
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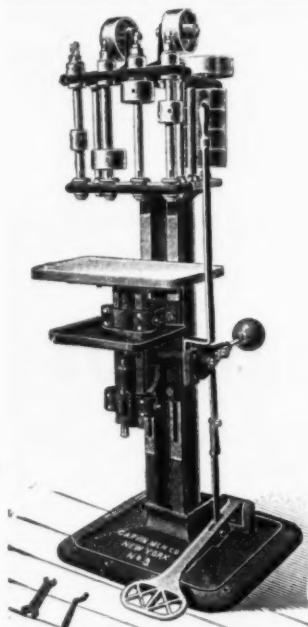
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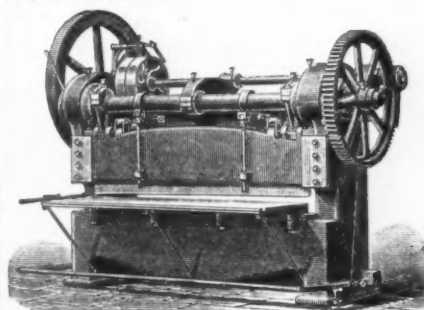
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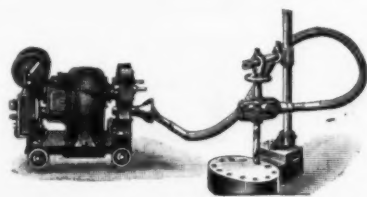


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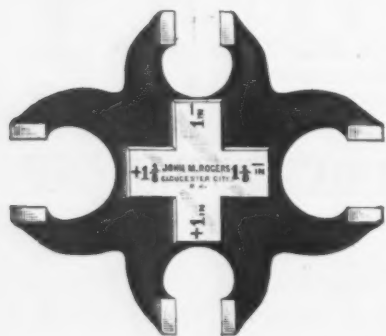


FIG. 14.

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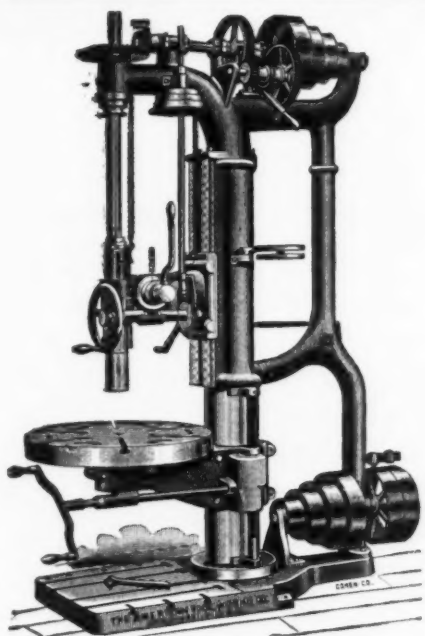
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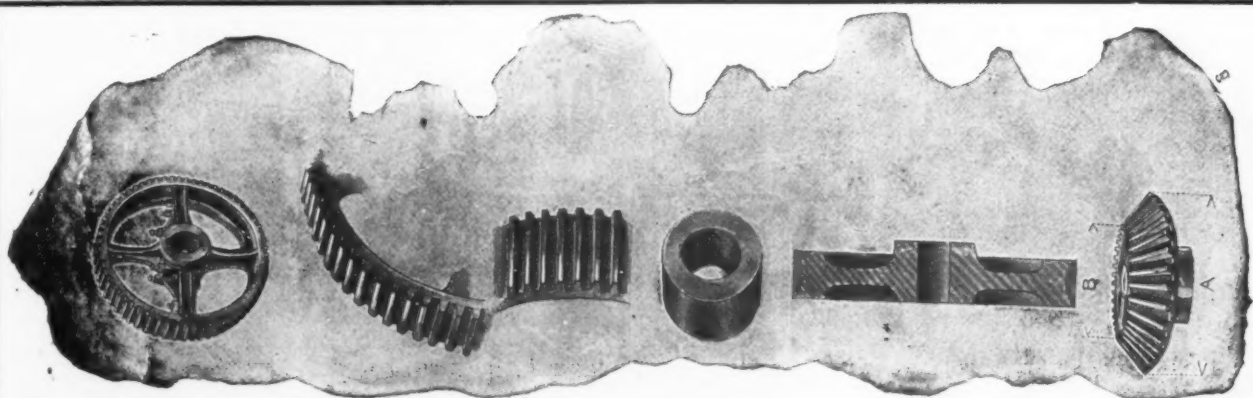
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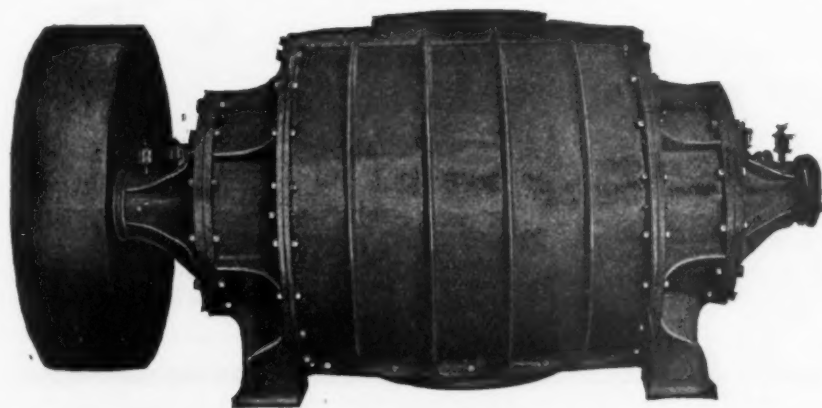
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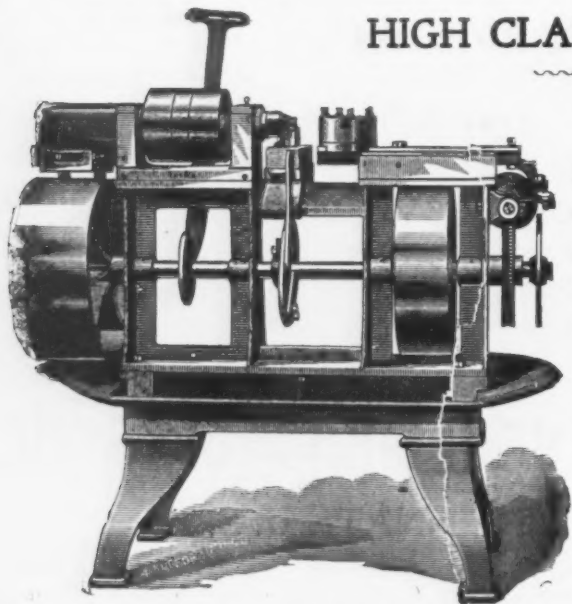
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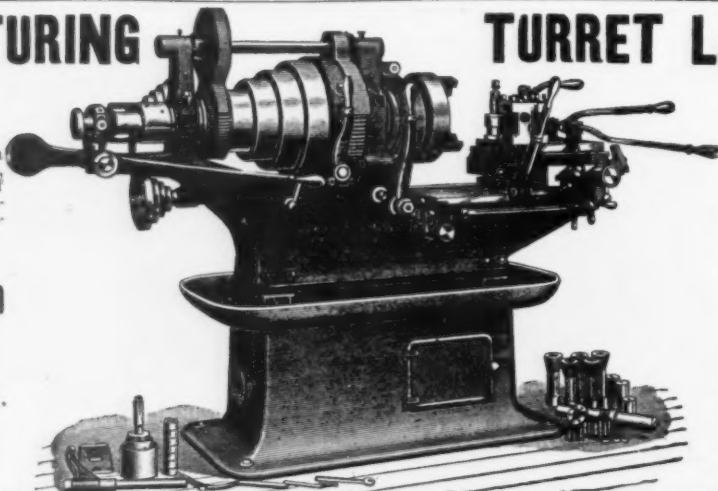
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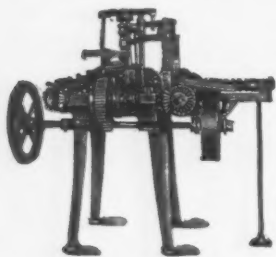


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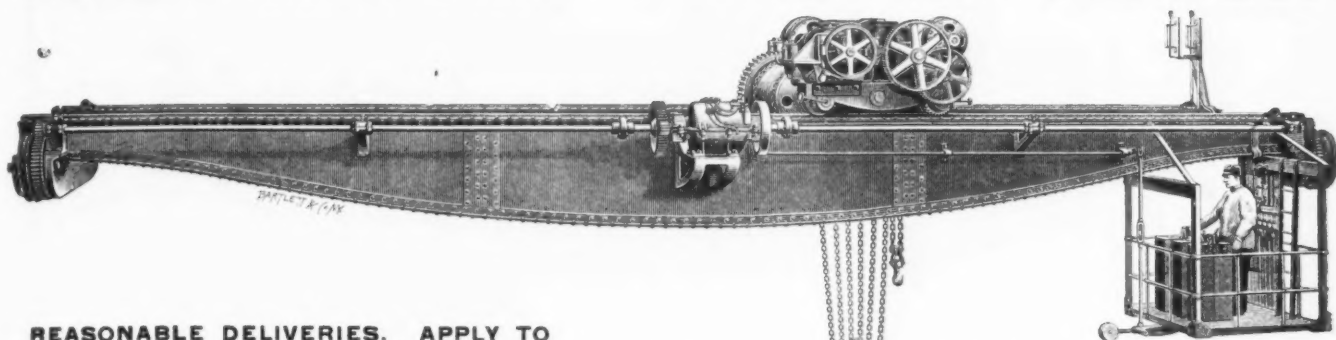
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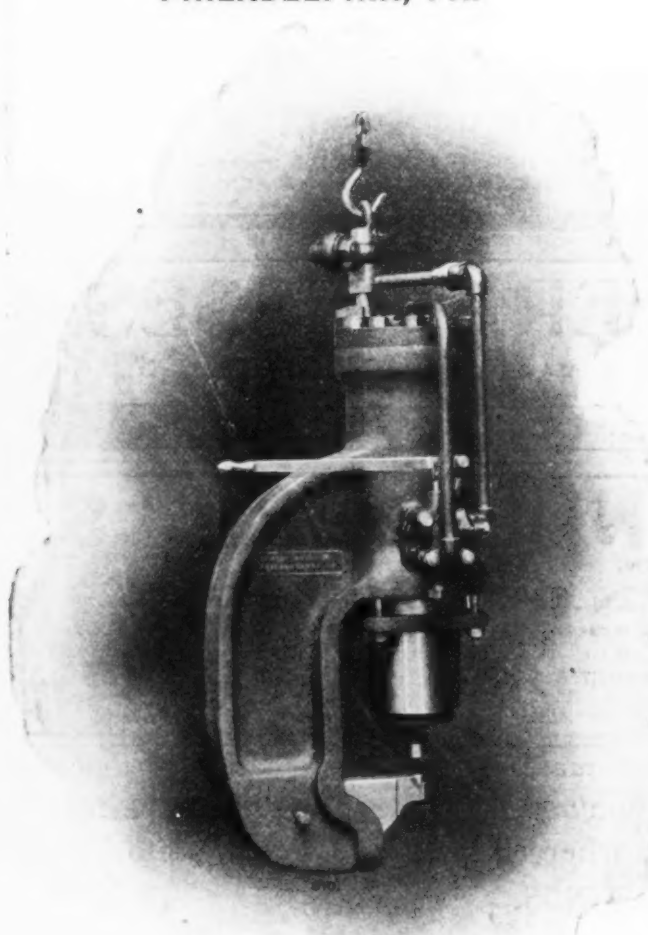
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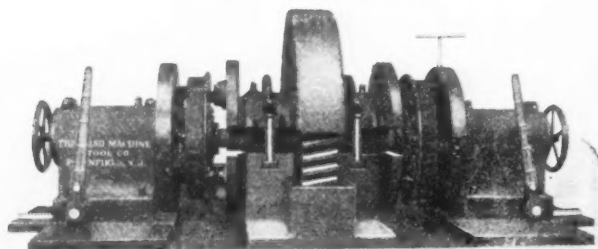
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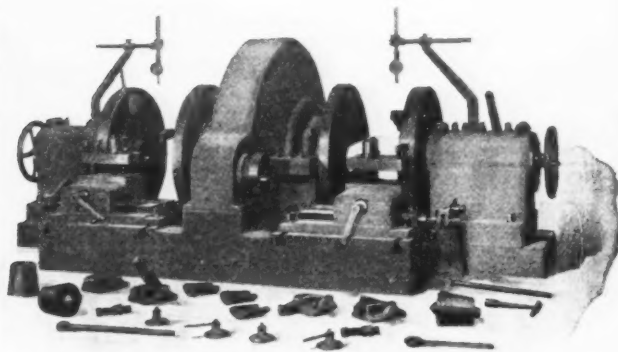
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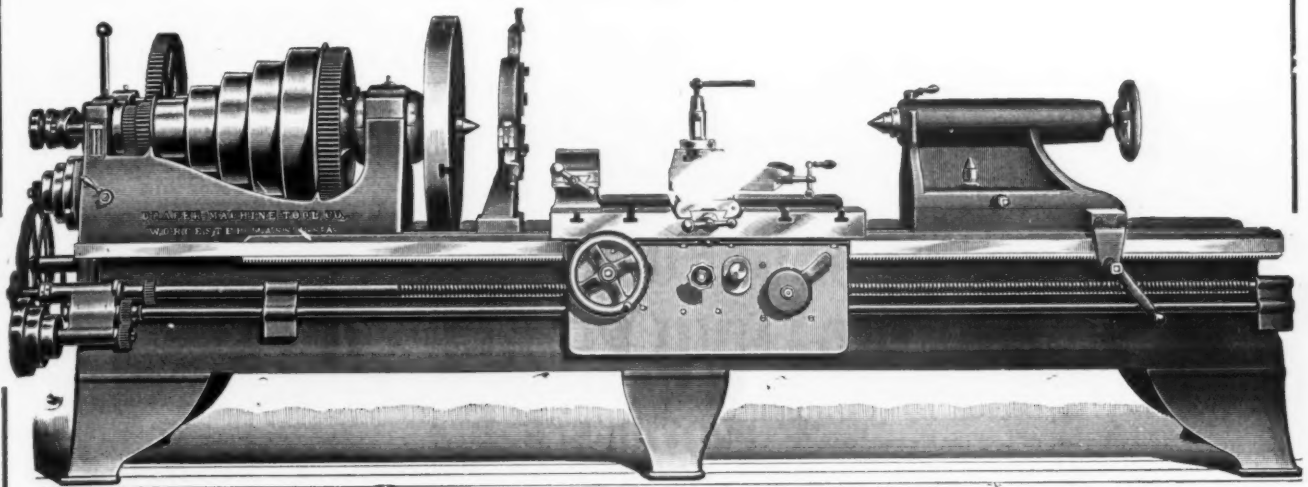
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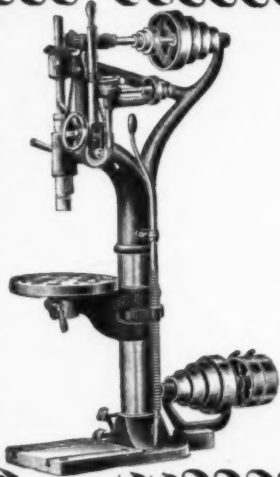
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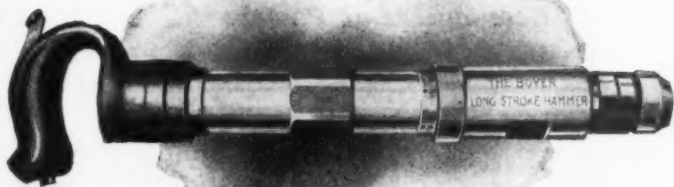
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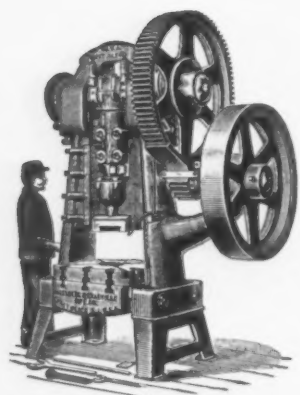
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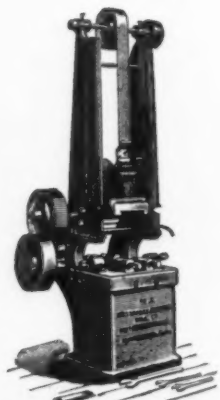
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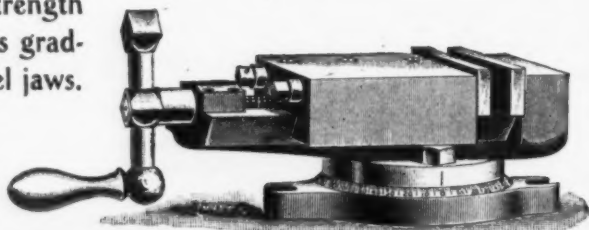
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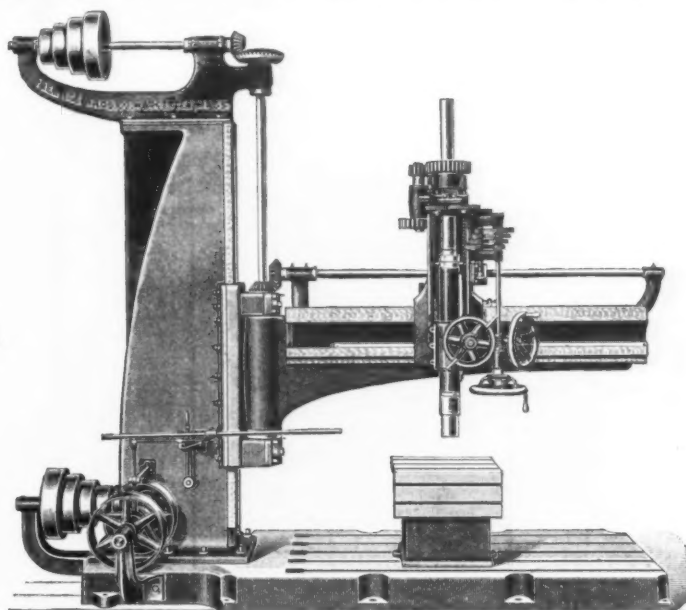


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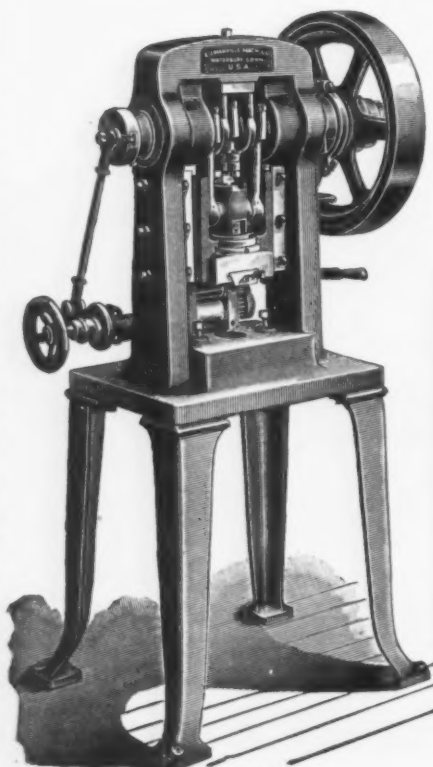


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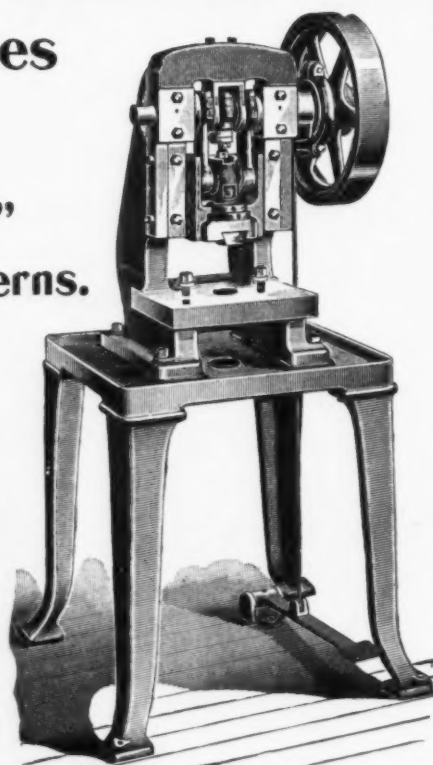


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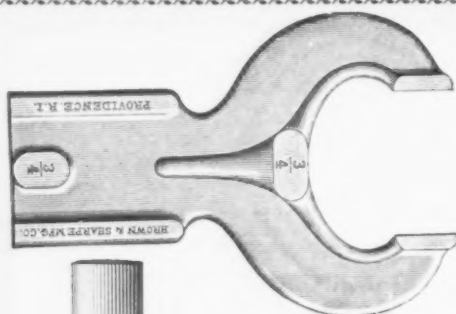
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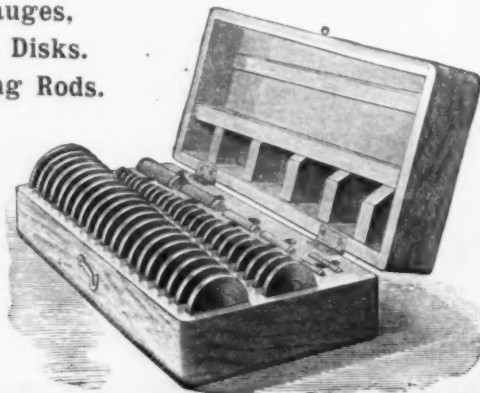
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1 48 in. Bement Upright Bor. Mill.  
1 Bement Heavy Bar Shear.  
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Several large Iron Tanks, round and square.

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WATER TUBE

# BOILERS

TWO 350 H.-P. UNITS.  
ONE 150 H.-P. UNITS.

Complete with McClave Shaking Grates, Breechings, full set of fixtures and trimmings.

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Two 44 x 16 Boilers, thirty 4 in. flues, new fronts, all fixtures and trimmings. Allowed 100 pounds pressure.

One 1200 H.-P. Berryman Feed Water Heater. Used two months. Built 1898.

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One right hand Wetherill Corliss Engine, cylinder 28 x 60; flywheel 20 feet diameter, weight 30 tons; shaft 15 in. x 12 ft. 6 in.; rope drive pulley 18 ft. diameter and grooved for 15 2-inch ropes; driven wheel 78 in. diameter grooved for 13 2-inch ropes; two iron idlers with boxes complete. With or without Independent Condenser 10x14x16.

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One 18 x 48 Wheelock Corliss Engine, complete, \$1,000.  
One 30 x 42 right Automatic Engine, complete, \$1,200.  
Eight 60 x 16 Horizontal Steel Tubular Boilers, complete, a bargain.  
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Three 11 x 18 celebrated Straight Line Automatic Engines, complete, at a bargain.

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AT A BARGAIN.

1 Second hand Corliss Engine, 14 in. x 42 in.

1 Blake Stone Crusher, 15 x 9 with screen.

1 Dean Duplex Steam Pump, 5 x 3 1/2 x 5.

3 Edson Diaphragm Pumps.

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One 18 in. x 42 in. Watts Campbell and 22 in. x 42 in. Wright Corliss Engines. High Speed Automatic, Simple, Compound, Condensing and Slide Valve Engines; also Blowing Engines, Boilers, Heaters, Pumps, Vacuum Pans, Ice Machines, Electric Motors, Generators, Railway Supplies, Metal Working and General Machinery.

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**SPECIAL BARGAINS.****LATHES**

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82 x 14 Betts, Comp. Rest.  
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1 72 x 16, 3 1/2 in. flues.  
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One 90 in. swing, 20 ft. bed Engine Lathe, triple geared. Face plate 60 in. dia. Spindle 10 in. dia. Carriage has screw feed and power cross feed. Lathe is very heavy and powerful and in first-class condition. Immediate delivery. Photograph on application.

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1 54 in. x 19 ft. Planer, double head.  
1 60 in. Heavy Radial Drill, 5 inch spindle.  
1 Small Horizontal Boring and Drilling Machine, Bement.  
1 12 H. P. Otto Gas Engine.  
1 No. 1 1/2 Pratt & Whitney Hand Milling Machine.  
1 No. 2 1/2 Newton Duplex Milling Mach.  
1 No. 5 Cleveland Auto. Screw Machine.  
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Two 12 x 11 and one 9 x 9 Westinghouse Engine.  
11 x 11 1/2 Vertical Engine.  
8 x 16 Rice Automatic Engine.  
600 H.-P. Rowe Feed Water Heater.  
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200 H.-P. Reynolds Heater.  
200 H.-P. Stillwell-Bierce Heater.  
70 H.-P. Otis Steel Fire Box Boilers.  
75 feet Double Leather Belt, 22 in.  
15 H. P. Gasoline Engine.  
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The above are all in first-class condition and ready for shipment.

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Manufacturers using iron, steel or wood will find the best locations for successful plants along the

### SOUTHERN RAILWAY.

These locations lead in cheap raw material, cheap, contented and desirable labor, cheap fuel and in good facilities for marketing products. Opportunities now open for establishing new plants are fine and should be investigated. Other investments will prove profitable in the South.

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## FOR SALE.

3 Steam Pans, 20 ft. x 8 ft., with 3 1/4 in. Steam space.  
BOVAIRD & CO.,  
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## FOR SALE.

One Pond Planer, 36 x 36 x 17 ft.  
One New Haven Lathe, 25 in. swing, 16 ft. bed.  
One vertical Engine 14 x 14, roughtry valve, self contain.  
One Sturtevant Steel Blower, 68 in. high, 26 inlet, 22 outlet.  
Also one Atlas 10 x 12 Engine.  
Also a large lot of iron tanks.

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## For Sale.

One Multiple Drill Press, four spindles, 8 ft. between housings, built by Messrs. Bement, Miles & Co. for drilling holes in plates.

Four trains of plate rolls.

One 9 ft. Fly wheel, new 7 in. bore; weight, 6,000 lbs.

One Rod Straightening Machine, built by the Medart Patent Pulley Co. for straightening Rods up to 3 in. diameter and 25 ft. long.

A lot of extra cold and hot plate rolls, new.

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### SECOND-HAND, FIRST-CLASS ORDER

3-16 in. Add. Rotary Wire Straightener, five dies with loose pulley on stand.  
25 lb. Justice Power Hammer  
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500 lb. Merrell Board Lift Auto. Drop Hammer.  
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800 lb. Pratt & Whitney Board Lift Automatic Drop Hammer.  
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2 1/2 in to 12 in. Curtis & Curtis Pipe Machine.  
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Garvin Single Spindle Profiler.  
No. 1 Warner & Swasey Screw Machine with wire feed.  
No. 3 Pratt & Whitney Screw Machine with wire feed.  
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18 in. throat Power Punch.  
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Plating Dynamos from 300 to 700 gallons capacity.  
Plating Tanks.  
14 in., 16 in., and 21 in. Engine Lathes.

### NEW.

Engine Lathes 12 in. to 38 in. Swing, various lengths of bed.  
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Nos. 1, 2 and 3 Cincinnati Full Univ. Mill'g Machs.  
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36 x 36 x 12 ft. Gray Planer with two heads.  
Write us for any machinery wanted, or what you may wish to exchange or sell.

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## SPECIAL BARGAINS.

## In Both New and Second Hand Machine Tools.

Special Tools and Machinery Designed and Built to Order.

Write us your wants.

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Hudson Ave. and Concord Street,  
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**FOR SALE.****SPECIAL ENGINES.**

- 1 14 in. x 20 in. (Vertical) Slide Valve.
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- \*1 11 in. and 9 in. x 24 in. Tandem Comp'd "Buckeye" (latest type) with condenser.
- †1 22 in. x 42 in. Wetherill Corliss.
- \*1 23 in. x 48 in. Geo. H. Corliss make.
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- 15 Very fine forged Shafts, finished all over, 10 in. diam. to 16 in.

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- Very fine steel self-supporting stack, 64 in. diam., 100 ft. high, with base casting, ornamental top and ladder.

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- 1 Hackney Cushion Hammer.
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- 1 New Alligator Shear with capacity up to 2 1/2 in. Cold Billets, or for Scrap cutting. Knives 14 in. long.

**LOCOMOTIVES, New and Second-Hand.**

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Sales Agent for  
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Locomotives, Horizontal and Upright Engines, Boilers, Pumps, Cars, Relaying Rails, Hoisting Engines, and lot of other material.

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Park Row Building, New York, N. Y.

**For Sale Cheap.**

- 7 Contractors' Plows, No. 99 "Syracuse."
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- 1 Portable Saw Mill, complete.
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- 3 Derrick Hoists.
- 5 No. 1 Jenne Jacks.
- 50 Two Wheel Road Scrapers, Western Wheel Scraper Co.
- 6 Narrow Gauge Dump Cars, 36 in.

SMITH &amp; CAFFEY,

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- 2 300-H.P. Boilers, 2 High Speed Engines, 2 Dynamos, 160 kilowatts, each plant complete.
- 3 1500-H.P. Corliss Engines, 1 12-H.P. Erie Engine.
- 8 125-H.P. Horizontal Tubular Boilers, 3 20-H.P. Upright Boilers, 1 300-H.P., 1 3000 Feed Water Heaters.
- 1 Hydraulic Riveting Machine, 86-in. gap.
- 1 Boiler Plate Planer, 16 ft. long, very heavy.
- 1 Power Shears, 1 Double Arbor Milling Machine, 1 48-in. Swing Lathe, short bed.
- 1 Horizontal Boring Machine, 3 new Woodward Pumps, several small Lathes, large lot Leather Belting.

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**FOR IMMEDIATE SALE.**

One Compound Non-Condensing Dean of Holyoke Duplex Pump. Cylinders 20 x 30 and 16 x 24. Can be fitted for condensing on request. This pump has never been used, was built for an elevator system which was changed at last moment and pump was not needed. The capacity of this pump is 3,000,000 gallons per day against 300 pounds pressure. This pump can be bought very cheap. For further particulars, address

JEFFERSON IRON CO.,  
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For sale or lease, at reasonable terms, factory site, well located, railroad siding, containing about 200 ft. front on railroad, with buildings, at New Castle, Penna.

For particulars address

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**WORK WANTED.**

Large Machine Shop and Foundry fully equipped with tools suitable for heavy work similar to steam Engines, desires to correspond with parties who have machinery to build. Capacity of shop, 75 men. Modern equipment.

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care The Iron Age, New York.

**WANTED.**

To buy a new or second-hand, in good order, Saw Mill, complete with edgers and cut-offs; also outfit for Planing Mill. Address

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# Rebuilt Machinery at Bargain Prices.

We have the largest plant of its kind on earth. Our **MACHINERY HALL** occupies a space 200 x 360 feet.

We cover all sales by a binding guarantee.

This list is an abbreviated one. State your wants.

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- A 396 5 9 in. turret speed lathes, 4 ft. 6 in. bed.
- A 397 1 8 in. turret lathe, 4 ft. 6 in. bed.
- A 398 1 8 in. turret lathe, 5 ft. bed.
- A 399 1 7 in. turret lathe, 5 ft. bed.
- A 400 1 6 in. turret speed lathe, 4 ft. bed.
- A 401 2 speed lathes, 4 ft. 6 in. bed, 12 in. swing.
- A 402 2 special brass turning lathes, 12 in. swing, 4 ft. bed.
- A 403 1 speed lathe, 4 ft. bed, 14 in. swing.
- A 404 1 6 in. turret speed lathe, 4 ft. bed, 13 in. swing.
- A 405 1 speed lathe, 5 ft. bed, 14 in. swing.
- A 406 2 extra heavy turret speed lathes, 4 ft. bed, 16 in. swing.
- A 255 1 screw cutting engine lathe, 18 in. swing, 8 ft. bed, Pratt & Whitney.
- A 256 1 ordinary metal lathe, 20 in. swing, 7 ft. bed.
- A 257 1 Ames screw cutting engine lathe, 16 in. swing, 6 ft. bed.
- A 258 2 Shepard engine lathes, 20 in. swing, 10 ft. bed.
- A 260 1 Pond engine lathe, 14 in. swing, 5 ft. bed.
- A 261 1 16 x 5 Ames engine lathe.
- A 262 1 ordinary metal lathe, 10 in. swing, 4 ft. bed.
- A 263 Pratt & Whitney engine lathe, 16 in. swing, 8 ft. bed.
- A 264 1 speed lathe, 6 in. swing, 4 ft. bed.
- A 266 Franklin plain engine lathe, 20 in. swing, 4 ft. bed.
- A 267 1 special lathe for wood working, 18 in. swing, 5 ft. bed.
- A 268 1 special wood working lathe, 4 ft. bed.
- A 2032 1 ordinary metal lathe, 10 in. swing, 4 ft. bed.
- A 2031 1 ordinary metal lathe, 20 in. swing, 8 ft. bed.

**ENGINES.**

- A 1 7 x 16 Woodruff & Beach.
- A 2 10 1/2 x 24 slide valve.
- A 3 6 x 7 upright.
- A 4 50 H.-P. Raymond gasoline.
- A 5 8 x 12, two double cyl. hoisting, made by Webster, Camp & Lane.
- A 6 6 x 9 F. D. Rice patent automatic.
- A 7 8 x 12 side crank.
- A 8 12 x 18 side crank.
- A 9 14 x 20 Struthers, Wells & Co.
- A 10 4 x 6 upright.
- A 11 12 x 16 side crank.
- A 12 9 x 12, 10 Tiff 16 H.-P. reversible.
- A 13 30 H.-P. Warren reversible.
- A 14 13 x 18, 4 valve Russell.
- A 15 14 x 20 single valve Russell.
- A 16 18 x 16 side crank.
- A 17 14 x 14 Ideal.
- A 18 10 x 16 Erie Ball.
- A 19 7 x 8 upright.
- A 20 12 x 13 1/2 Westinghouse.
- A 21 6 x 10 slide valve.
- A 22 11 x 10 upright.
- A 23 6 1/2 x 20 Chandler & Taylor.
- A 24 7 x 7 slide valve.
- A 25 12 x 20 x 14 Ball compound.
- A 26 13 x 22 x 12, 2 Westinghouse compound.
- A 27 4 x 5 Westinghouse, Jr.
- A 28 8 x 12 Atlas.
- A 29 6 x 12 Rlymer.
- A 30 9 x 14 Woodbury.
- A 31 6 x 12 Westinghouse, Jr.
- A 32 2 1/2 x 3 1/2 side crank.
- A 33 8 x 16 Russell-Gibbs.
- A 34 9 x 14 side crank.
- A 35 8 x 14 center crank.
- A 36 18 x 28 Nicol & Co.
- A 37 6 x 10 side crank.
- A 38 21 x 32 Watertown.
- A 39 7 x 10 side crank.
- A 40 14 x 24 slide valve.
- A 41 14 1/2 x 13 Armstrong & Sims.
- A 42 6 x 8 Ottumwa.
- A 43 10 x 18 automatic.
- A 44 6 x 12 side crank.

- A 45 12 x 12 Westinghouse.
- A 46 9 x 16 link motion.
- A 47 12 x 12 ideal.
- A 48 12 x 12 slide valve.
- A 49 10 x 14 Wright & Adams.
- A 50 22 1/2 x 36 Wright automatic cut off, left hand Corliss; bed, 8 ft. long 3 ft. wide; shaft, 8 ft. 6 in. long.
- A 51 9 x 14 center crank.
- A 52 12 x 16 side crank.
- A 53 10 x 16 center crank.
- A 54 10 x 14 side crank.
- A 55 16 x 36 gear valve motion.
- A 56 5 H.-P. Otto gas.
- A 57 100 H.-P. Westinghouse automatic compound.

**BOILERS.**

We have purchased from ARMOUR & CO., Chicago, their entire boiler outfit, which has been sold to us, owing to the change of their motive power from steam to electricity. They are all in excellent condition, and we have repaired and replaced any defective parts or tubes. They are horizontal tubular, extra strong built, and consist of the following: 48 60 x 18, 12 60 x 16, 12 64 x 16. We have other kinds of boilers also, and will send our complete list on application. They range in size from 6 H.-P. up to 600 H.-P.

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We have over 250 different patterns of steam pumps. Complete list on application.

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We have all kinds. State your wants.

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We carry a complete stock of brand new and second-hand leather and rubber belting at prices one-half of others. We guarantee all sales in this line.

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Write for our catalogue of electrical supplies. We can save you money.

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- A 336 1 threader and nut machine, 1 in.
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- A 60 2 No. 4 Pulsmeter steam pumps.
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- A 63 1 No. 7 Sturtevant noiseless blower.
- A 64 1 No. 3 Sturtevant blower for cupola.
- A 65 2 Royersford No. 3 blowers.
- A 66 1 No. 10 Buffalo blower.
- A 67 1 No. 8 Buffalo blower.
- A 68 1 10 in. Champion blower.
- A 69 1 No. 9 Gleason & Bailey blower.
- A 70 2 No. C14 Chaffanooga blower.
- A 71 6 hand power blowers, 14 in. diameter.
- A 72 1 18 in. double exhaust fan.
- A 73 1 54 in. window ventilating fan.
- A 74 1 No. 3 Rice & Whitacre heater.
- A 75 1 No. 1 Smith-Hill open heater.
- A 76 2 No. 4 Stillwell-Bierce heaters.
- A 77 2 No. 13 Barragawanath heaters.
- A 78 2 36 in. turbine water wheels.
- A 79 1 10 ft. x 6 ft. rendering tank.
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- A 395 1 polisher or buffer complete with 9 wheels.
- A 412 1 friction clutch pulley, 38 in. diameter.
- A 414 1 Pony planer, 9 in. cylinder.
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We have a large stock of second-hand radiators that we have thoroughly overhauled, and which we can quote at extremely low prices. Also a stock of brand new radiators.

Write for our complete catalogue No. 78. We are constantly buying entire stocks of hardware at Sheriffs' and Receivers' Sales.

Our prices on Axes, Anvils, Brass Valves and Fittings, Registers and Ventilators, Iron Roofing, Iron Pipe, etc., etc., are bound to interest you.

## CHICAGO HOUSE WRECKING CO.,

West 35th and Iron Sts.,

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**FOR IMMEDIATE DELIVERY.**  
**Angles, Beams,**  
**Channels, Plates,**  
**Tees, Zees, Bars.**

5000 tons in stock. Moderate prices. Send for stock sheet and quotations.

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Designers, Manufacturers and Erectors of  
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**BEAMS, CHANNELS,**  
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Eye Beams, from 4 ins. (7½ lbs.), to 20 ins. (65 lbs.)  
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 Zee Bars, 3 ins., 4 ins. and 5 ins.  
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All material in 50-ft. lengths, or cut to specified lengths if desired. Send for detail stock list.  
 All material in stock, and will be shipped immediately on receipt of order.

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**STEAM PUMPS.**

One 6 in. x 5 in. x 6 in. Miller, Duplex, Steam Pump.  
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 One 4½ in. x 5 in. x 5 in. Hughes, Duplex, Steam Pump.  
 One 4 in. x 10 in. x 7 in. Dean Bros., Double-acting, Single Steam Pump.  
 One 7 in. x 5 in. x 9 in. Knowles, Double-acting, Single Steam Pump.  
 One 4½ in. x 2½ in. x 4 in. Worthington, Duplex, Steam Pump.  
 One 7½ in. x 4½ in. x 10 in. Buffalo, Duplex, Steam Pump.  
 One 5 in. x 8½ in. x 7 in. Hughes, Steam Pump.  
 One 2 in. x 5 in. Belt-driven Pump. Pulley, 6 in. x 8 in. x 9 in.  
 One 8 in. x 14 in. x 10 in. Brake, Air Pump.  
 One 8 in. x 12 in. x 12 in. Blake, Duplex, Low service, Steam Pump.

WISCONSIN MACHINERY CO.,  
 125-127 West Water St., Milwaukee, Wis.

**FOR SALE.**

**Second Hand Machine Tools, &c.**

2-15 in. x 5 ft. Monitor Lathes, for brass work with counter shaft.  
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 1-16 in. x 6 ft. Eng. S. C. Lathe with counter shaft. Ames' make.  
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 1-22 in. Blaisdell Drill.  
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 1-Sprue Cutter, deep throat, 13 in., heavy.  
 4-Brass Furnaces, 24 in. x 36 in. (used 3 months).  
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Apply to  
**NORTHERN ENGINEERING WORKS,**  
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**Second Hand Machine Tools, Etc.**

Two ten stamp belt driven Atmospheric Stamps.  
 One 30 in. Boring and Turning Pulley Lathe.  
 Defiance Balancing Machine.  
 One Shaft Straightening Machine, 28 ft. bed.  
 One double end Shaft Centering Machine.  
 One Garvin No. 2 Hand Milling Machine.  
 One (each) No. 3, No. 2 and No. 4 Dallett Portable Drill Presses.  
 25 to 200 H.P. Slide Valve Engines.  
 One New Compound Duplex Direct Acting Steam Pump, a million capacity.  
 Three Logging Locomotives.  
 Two 20 ton 41 ft. span Morgan Cranes with 480 ft. of 3½ in. square shaft and hangers.

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4,000 tons 60 lb. steel relaying rails, with angle bars.  
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 400 tons 56 lb. steel relaying rails with splices.  
 One mile 40 lb. steel relaying rails with splices.

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**STILL PURCHASING IRON AND STEEL SCRAP.**

Considering the slump in the market we are always ready to **buy for cash.**  
 Relaying Rails always on hand.

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**RELAYING RAILS, Etc.**

1,500 tons 60 lb. Steel, with Angle Bars.  
 300 tons 40 lb. Steel, with Splices.  
 150 tons 35 lb. Steel, with Splices.

**New and Second-Hand Freight Cars.**  
**MAY & SPALDING,**  
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140 tons 35-lb. Steel, with splices.  
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 100 tons 50-lb. Steel, with splices.  
 1500 tons 56 lb. Steel, with angle-bars.  
 Tidewater delivery.  
**THE STEEL RAIL SUPPLY CO.,**  
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**RAILS.**

New Light Rails.

Relaying Rails.

Rails cut to order.

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**Scrap Iron and Steel.**

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Dealers in old iron and metals; also new and second-hand iron and wood working machinery.

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**SCRAP IRON.**

We reduce to merchantable size large pieces of iron and steel scrap. Will buy scrap of this kind. Correspondence solicited.

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**20 New Steel Tanks.**

Round and Square—Open Tops—All Sizes.

½ in. sides, 5-16 in. bottom, outlets, angle iron around top braced inside, tested, but never used.  
 3000 to 18,000 gallons. Prices on application.

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**Scrap Iron, Steel and Metals.**  
**New Jersey Iron & Metal Co.,**  
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Write us when you have Scrap to dispose of or want to buy.

**Scrap Iron, Steel and Iron Rails**

bought and sold by

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Telephone Call, 897 18th St.

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**IRON AND STEEL SCRAP.**

**IRON AND STEEL RAILS, PIG IRON, ETC.,**  
**220 Broadway.**

**ST. PAUL BUILDING,** NEW YORK.  
 TELEPHONE, 975 CORTLANDT.

Correspondence Solicited.

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**243 FRONT ST., NEW YORK.**

**OLD METALS**  
 of every description purchased for cash, also  
**SCRAP IRON and STEEL**

In carload lots.  
 Correspondence solicited.

**Scrap Iron and Old Metals.**

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**278 to 298 Marietta St., Atlanta, Ga.**

**CORRESPONDENCE SOLICITED FROM**  
**BUYERS AND SELLERS.**

**WANTED.**

**SCRAP STEEL.**

Give description and price delivered our yard, Pottstown, Pa.

**Donaldson & Newton,** 421 Chestnut St., Philadelphia, Pa.

I buy Iron and Metal Scrap and wish to hear from anybody having cotton ties, pipe, hoops, cast borings, wrought and steel turnings, boilers, cast scrap, etc. Also wrecks from fire, etc.

**ROBERT M. CUNLIFFE,**  
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**BERKSHIRE IRON YARD,**  
**M. H. ROGER, Owner.**

**Scrap Iron, Metals, Etc.**

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**SCRAP WANTED.**

Light and Heavy Machinery Cast.  
 Wrought Iron and Steel Scrap.  
 Wrought Turnings and Cast Borings.  
 Send full description of material with lowest cash price.

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**Wagon Tires,**

**STEEL OR IRON,**  
**RD. EDGE OR SQUARE.**

**Angles Up To Four Inch.**

**LOGAN IRON & STEEL CO.,**  
**BURNHAM, PA.**

**Buyers of Scrap for Cash.**



# Special Screw Machine Work Wanted.

We are fully equipped with latest appliances for handling this work, especially that required for Bicycle or Automobile manufacture, and are prepared to quote low prices for those interested. Estimates for this class of work gladly furnished on application. Correspondence solicited.

## J. STEVENS ARMS AND TOOL CO.,

P. O. Box 46,

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### WATER PIPE FOR SALE.

23,000 feet 20 in. Cast Iron Water Pipe made by E. D. Wood & Co., 170 lbs. to foot, in 12 ft. lengths, in first-class condition for re-use.

Will be sold in lots to suit.

FRANK SAMUEL,

Harrison Building, Philadelphia, Pa.

## FOR SALE.

- 1 No. 1 Brown & Sharpe Universal Milling Machine.
- 1 Semi-Universal Milling Machine, Worcester Machine Co.
- 1 24 x 24 x 6 Gray Planer, new.
- 1 26 x 26 x 8 Planer.
- 1 18 x 18 x 5 Planer, with chuck.
- 1 16 in. D. T. quick stroke Shaper, Gould & Eberhardt.
- 1 12 in. Shaper, heavy machine, Michels.
- 1 36 in. heavy Bk. Gd. Drill Press, Massinet Mfg. Co.
- 1 20 in. Back Geared Drill Press and Chuck, Davis.
- 1 13 in. Sensitive Drill and Chuck, W. & R.
- 2 No. 2 Garvin Screw Machines.
- 1 Gray Screw Machine.
- 1 13 in. x 6 ft. bed, No. 6 Barnes Engine Lathe and Counter Shaft.
- 1 24 in. x 16 ft. Engine Lathe.
- 1 24 in. x 12 ft. " "
- 1 24 in. x 10 ft. " "
- 2 20 x 8 Engine Lathe, chain feed, \$30.00.
- 1 18 x 8 " " Michels.
- 1 16 x 6 " " Blaisdell.
- 1 15 x 6 " " Star Tool Co.
- 1 14 x 6 " " Pratt & Whitney.
- 1 Bench Lathe, draw-in Chucks, compound rest.
- 1 Graves Hydraulic Elevator and Car, complete, capacity 3,000 lbs.
- 1 2 x 3 Gould Triplex Power Pump.
- 1 No. 0 Knowles Single Acting Steam Pump.

**MACHINISTS' SUPPLY CO.,**  
Rochester, N. Y.

## BARGAINS.

We have the following new and second-hand Tools which we desire to dispose of, at extremely low prices:

- 1 25 in. Barnes Drill Press.
- 2 2 in. Cleveland Automatic Screw Machines, second-hand.
- 1 8 in. Boynton & Plummer Shaper.
- 1 10 in. " "
- 1 No. 1 Diamond Wet Tool Grinder.
- 1 No. 3 " "
- 1 No. 4 Greenard Arbor Press.
- 1 14 x 5 American Brass Lathe, set over tail stock, second-hand.
- 4 14 x 5 Lodge & Davis Brass Lathes, set over tail stock, second-hand.
- 1 13 x 5 Speed Lathe, second-hand.
- 2 11 x 4 Wells Bros. Speed Lathes.
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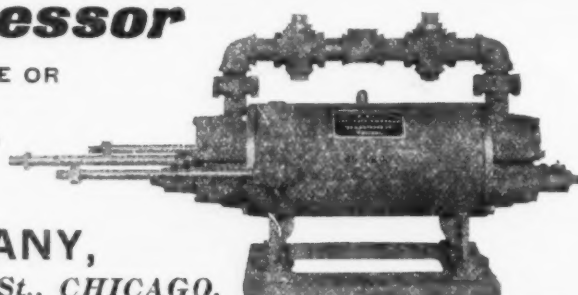
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**Dynamos and Motors.**—The publishers of Crocker & Wheeler's Practical Management of Dynamos and Motors have recently printed the ninth thousand of that book, which continues in demand among electrical engineers, students and workmen. The manual gives simple directions for the practical use and management of dynamo electric machines and electric motors, dealing with all the more important matters which present themselves in the handling of these machines. 206 pages, cloth. Price.....\$1.00

**Electrical Rules and Tables.**—The usefulness and popularity of Monroe and Jamieson's Pocket Book of Electrical Rules and Tables as a reference has occasioned bringing out the fourteenth enlarged edition, revised. The new or recent matter includes numerous special articles and tables covering later developments in the science, and prepared by numerous experts. Part the first deals with the fundamental principles and measurements. The second part with their applications, including telegraphy, telephony, electric lighting and the transmission of power by electricity. The book contains 734 pages in very compact form (size for pocket). Leather. Price.....\$2.50

**Portland Cement.**—An authoritative German manual on the properties and uses of cement, compiled by L. Golinelli, and published by the Association of German Portland Cement Manufacturers, has been given a full translation into English by S. B. Newberry, E.M.Ph.D. Numerous editions of the original were sold within a short time, and it is believed that the pamphlet, giving as it does results of late German research, will be useful to cement consumers here, especially to contractors and masons. The title is "How to Use Portland Cement." Paper. Price, 50 cents.

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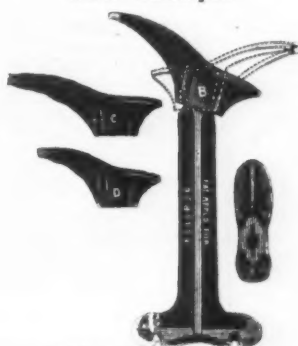
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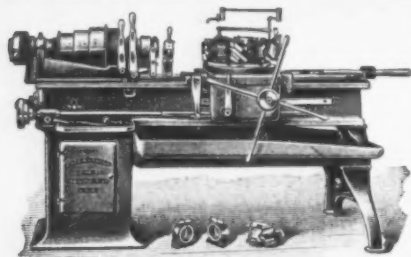
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PAGE 6.

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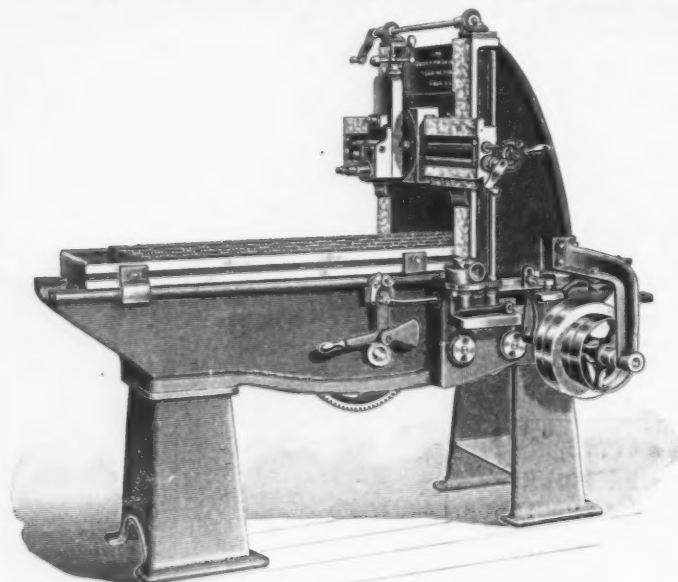
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# THE IRON AGE

THURSDAY, SEPTEMBER 13, 1900.

## The Han-yang Steel Works, China.

BY F. LYNWOOD GARRISON, PHILADELPHIA.

The only iron and steel works of any importance in the great empire of China are located in the city of Han-yang, at the confluence of the Han River with the Yangtse, in the province of Hupeh. This locality is by far the most important commercial center in the interior of China. Here are situated three large cities, Han-kow on the north bank of the Yangtse, Han-yang between the forks of the two rivers, and Wu-chang on the south bank of the Yangtse, the distances separating the three being only the width of the river beds. As navigation upon these great rivers is never interrupted

an enormous loss. The reasons for this, and why they are run at all under such circumstances, are easy to explain, but probably would not be credited by those unfamiliar with Chinese character and methods. It will, perhaps, suffice to state that a lack of success in great industrial enterprises of a mechanical and technical character is not due to a want of natural intelligence and of adaptability in the Chinese. It is probably owing to inelastic and conservative conditions to which the Chinaman clings as though his life depended upon it. Every new enterprise in China must fight this incubus, and it is only when associated with honest and able foreigners that success can be assured. The Chinese are, without doubt, the most intelligent and vigorous Oriental people, and were their energies as well directed as those



THE HAN-YANG STEEL WORKS, CHINA.

by ice, and as there is usually sufficient water to allow large ocean steamships to ascend the Yangtse to Han-kow, 600 miles above its mouth, the advantages of Han-yang as a commercial center are obvious. It was probably this consideration as much as any other that influenced the Chinese Government to establish these large works here. The conception of the project some six or eight years ago was due to the progressive spirit of the able viceroy, Chang-Chi-tung. The enterprise on the whole was well planned, and, with the exclusive management in other hands than Chinese, no doubt would have proved a great success.

As far as the writer has been able to determine from a rather hasty and superficial investigation, there seems to be no substantial reason why a well equipped and managed steel works in this locality should not be extremely profitable. Such, however, is not now the case, as it is well known in China that the works are run at

of the Japanese the political situation in the far East would be radically different.

The steel works, which are shown in the accompanying photograph, lie in a depression which was once part of the river bed, and to obtain a sufficient grade for proper drainage it was necessary to fill in about 12 feet and to construct a dike along the river front of the same or greater height.

The establishment comprises a blast furnace plant, puddling furnaces and rolling mills, two Bessemer steel converters, an open hearth plant, rail mills, machine shops, foundry, &c., fairly complete and modern in most respects at the time of installation.

The two blast furnace stacks are 64 feet high. With good coke these furnaces will, it is claimed, produce from 75 to 80 tons each per day, but as the coke ordinarily used is poor, the average production is not over 60 tons.

There are 20 single puddling furnaces of the usual

size and built in groups of four, the waste gases being used to heat a vertical boiler. Five hundredweight charges are treated in each, and the blooms are worked under two 3-ton steam hammers and passed through a 20-inch train of roughing rolls. Sheet mills are supposed to be included in the plant, but I do not know if they are now in operation.

The two Bessemer converters are of 5 tons each, and there is one 12-ton open hearth furnace of ordinary construction supplied by four Wilson gas producers. The rail mills are of no special interest. The foundry has a 20-ton traveling crane and three cupolas.

The iron ores used in the blast furnaces come from the Taye-shan district, about 45 miles down the Yangtse, and located some 15 miles south of the river, being connected with it by a short line of railway. The ore is mostly magnetite, having an average composition of 63 per cent. of iron, 4 to 5 per cent. of silica, 0.05 to 0.08 per cent. of phosphorus and 0.10 per cent. of sulphur.

The iron ore deposits at Taye will probably rank with the largest in the world, when they are more extensively developed. It is interesting to note in this connection that the Japanese are now drawing on these deposits to supply their new and very large steel works at Wakamatsu, near Moji, Japan, their domestic supply of iron ore being apparently inadequate.

Great difficulty has been experienced at Han-yang in obtaining a good and sufficient supply of coke, though it is difficult to understand why this should be so, in view of the vast quantity of good coal to be easily had in China and in or near the Yangtse Valley. The best yet obtained comes from the province of Hunan, where it is made by the natives in crude pits about 2 x 3 feet in section. Good coke is also obtained from the Kaiping collieries, near Tientsin. The Hunan coke carries about 12 to 15 per cent. of ash, and the Kaiping about the same. It is well known that good coking coals are found much nearer Han-yang than either of these localities, but as yet no attempt has been made to utilize them.

The coal and iron resources of China are probably far greater than any other country in Asia, if not also in Europe. Hence if the ceaseless industry and a high degree of natural intelligence characteristic of the population, together with vast stores of coal and iron ore, can make a nation rich and powerful, China will once again rule the far East as she did in days of yore. Whatever may be the shortcomings of the Chinese, however much they may be behind us in all things mechanical, no one who has lived among them can say they are degenerate, or that the race has lost its virility. These are facts to ponder over in these days, when the mineral resources of Europe and even parts of the United States are evidently becoming exhausted.

### Power Consumption of Rolling Mills.

Although a good deal has been written of late on the application of electric power to rolling mill operations, few tests have been made of the power consumed on the various operations. The following tests made at a steel works on the continent are, therefore, given here as throwing some light on this subject:

#### The Consumption of Electric Power During the Rolling of a 9-inch Joist.

The ingot weighed 3300 pounds. These observations are the average of the rolling of 44 ingots during four hours (14,400 seconds), the train going at the normal speed. The average time for rolling one bar is thus 327 seconds.

#### Motor No. 1, Driving the Skid Gear and the Live Rollers in Front of the Finishing Train. (For One Bar.)

	Volts.	Amperes.	Seconds.	Kilowatts.	Horse-power.
Not working.....	450	30	214	13,500	18.342
Working.....	450	60	12	27,000	36.684
Working.....	450	80	30	36,000	48.913
Working.....	450	100	10	45,000	61.141
Working.....	450	150	17	67,500	91.712
Working.....	450	200	25	90,000	122.282
			327		

#### Motor No. 2, Driving the Live Rolls in Front of the Roughing Rolls.

	Volts.	Amperes.	Seconds.	Kilowatts.	Horse-power.
Not working.....	450	25	172	11,250	15.285
Working.....	450	80	3	36,000	48.913
Working.....	450	100	38	45,000	61.141
Working.....	450	125	110	56,250	76.426
Working.....	450	150	4	67,500	91.712

#### Motor Driving the Live Rolls to the Cooling Shed.

	Volts.	Amperes.	Seconds.	Kilowatts.	Horse-power.
Not working.....	450	12	236	5,400	7.337
Working.....	450	50	46	22,500	30.600
Working.....	450	75	27	33,750	45.679
Working.....	450	150	18	57,500	91.712

Amperes.

Motor of 150 horse-power live rollers for skid gear.....	300
Motor of 110 horse-power live rollers before first and second train..	125
Motor furnace charging machine .....	25
Motor fan for furnace.....	25
Motor saw .....	80
Motor rollers for saw.....	100
Motor skid gear in cooling shed.....	100
Motor shears.....	20
Motor rail straightening machine.....	150
Motor lathes for rolls.....	60
Motor crane for lathe shop.....	40
Motor small shop for three-high train.....	15
Motor electric locomotive.....	50
Motor inclined plane.....	120
Motor several small motors .....	25

Total..... 1,135

The central station under normal conditions furnishes a current which varies in intensity from 400 to 700 amperes. The above tables give the results obtained at a trial during which 44 ingots were rolled in 14,400 seconds at normal speed. The ingots weighed 3300 pounds and were rolled into 9-inch girders; the average time per bar was 327 seconds, as stated above.

#### Consumption of Electric Power During the Rolling of a 12-inch Beam.

The tables below give the results obtained when rolling an ingot weighing 5060 pounds. These observations were the average of the rolling of 22 bars during a period of 1 hour and 50 minutes, the train going at normal speed. Average time for rolling one bar, 300 seconds.

#### Motor No. 1, Driving the Skid Gear and the Live Rollers in Front of the Finishing Train. (For One Bar.)

	Volts.	Amperes.	Seconds.	Kilowatts.	Horse-power.
Not working.....	450	30	175	13,500	18.342
Working.....	450	60	10	27,000	36.684
Working.....	450	80	46	36,000	48.913
Working.....	450	100	10	45,000	61.141
Working.....	450	150	30	67,500	91.712
Working.....	450	200	29	90,000	122.282

#### Motor No. 2, Driving Live Rollers in Front of the Roughing Train.

	Volts.	Amperes.	Seconds.	Kilowatts.	Horse-power.
Not working.....	450	25	165	11,250	15.285
Working.....	450	50	10	22,500	30.600
Working.....	450	125	125	56,250	76.426

#### Motor Driving the Rollers to the Cooling Shed.

	Volts.	Amperes.	Seconds.	Kilowatts.	Horse-power.
Not working.....	450	12	57	5,400	7.337
Working.....	450	50	53	22,500	30.600
Working.....	450	60	100	27,000	36.684
Working.....	450	75	66	33,750	45.855
Working.....	450	100	24	45,000	61.141

The ampere meter of the motor driving the live rollers of the tables is only graded up to 150 amperes, but the needle often passes this point.

#### Motor Driving the Skid Gear of the Cooling Shed. (For one Bar)

	Volts.	Amperes.	Seconds.	Kilowatts.	Horse-power.
Not working.....	450	25	..	9,000	12.228
Working.....	450	78	16	33,756	45.855
Working.....	450	50	12	22,500	30.600
Working.....	450	50	15-35	22,500	30.600
Working ..	450	35	40-30	15,750	21.400

#### Motor Driving a Saw.

	Volts.	Amperes.	Seconds.	Kilowatts.	Horse-power.
Not working.....	450	10	296	4,500	6.104
Working.....	450	75	50	33,750	45.855
Working.....	450	80	14	36,000	48.908

In order to cut each bar from five to six sweeps of the saw were required; for each sweep the motor consumes from 75 to 80 amperes in 10 seconds; as soon as the bar begins to cool—which is usually the case at the last sweep—the current runs up to 80 amperes and the time to about 14 seconds. These tables demonstrate that the expenditure of power varies considerably, and they also prove that electric motors are well adapted for driving the live rollers and other machinery in a rolling mill; they do not consume more power than is required for the work they may be called upon to perform. This is especially striking in the case of the saws; when not working for 236 seconds the consumption was 10 amperes, and when working for 64 seconds it was from 75 to 80 amperes.



### Iron and Steel Institute.

At the Paris meeting, to be held on September 18, 19 and 20, the following papers will be presented:

"On the Development of the Iron and Steel Industries in France Since 1899," by H. Pinget, secretary of the Comité des Forges de France.

"On Iron and Steel from the Point of View of the 'Phase Doctrine,'" by Prof. Bakhuis-Roozeboom (Amsterdam).

"On Iron and Steel at the Paris Exhibition," by Prof. H. Bauerman (Ordinance College, Woolwich).

"On American Methods of Testing Iron and Steel," by Albert Ladd Colby (South Bethlehem, Pa.).

"On Rolling Mills," by Louis Katona (Resicza, Hungary).

"On the Constitution of Slags," by the Baron H. von Jüptner (Donawitz, Austria).

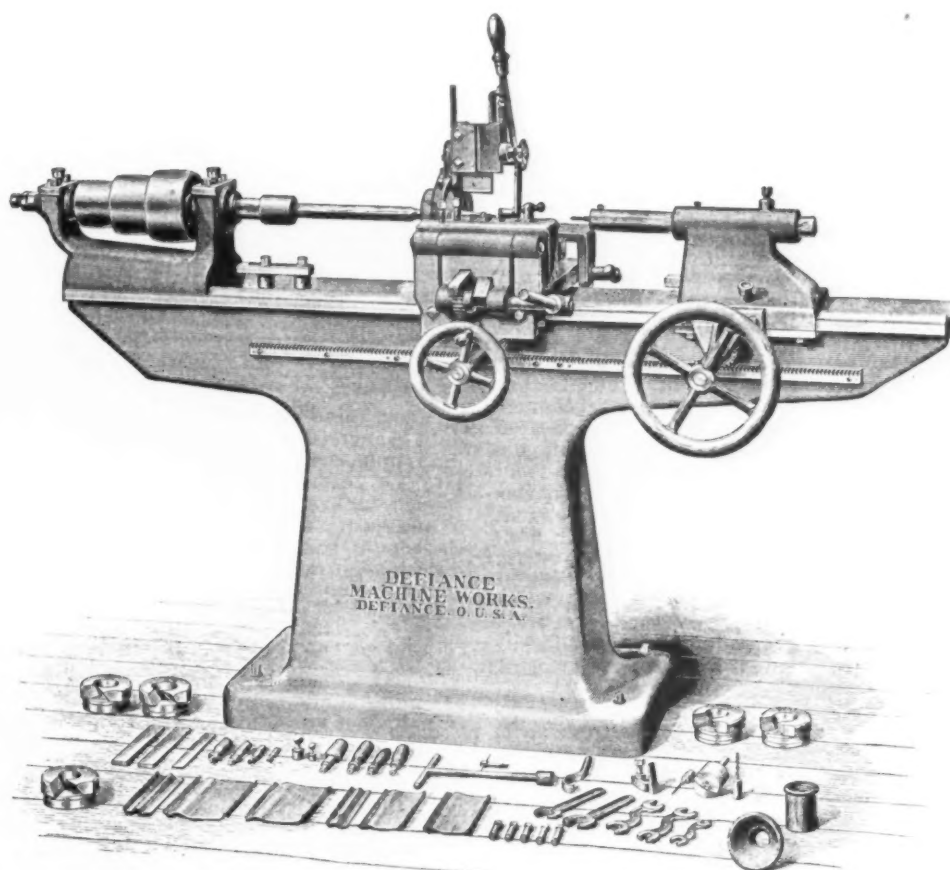
"On a New Method of Producing High Temperatures," by Ernest F. Lange (Manchester).

"On the Action of Aluminum on the Carbon of Cast

ing the knife it is only necessary to dress the cutting edge, and therefore it can be handled successfully by inexpensive labor.

The frame of the machine is cast in one piece, and the top is accurately planed and scraped to bearing for the working parts. The head spindle is of steel, runs in large self oiling bearings, and is driven by a three-step cone. The front end of the spindle is fitted with a screw chuck to hold one end of the piece to be turned, the other end turning in the roughing head bush. The cutter head carriage is gibbed to the top of the frame and is provided with a horizontal movement by hand wheel to move the cutters to the point where the turning shall begin. It also has a movement at right angles by hand lever, to bring the finishing knife to the work. The roughing cutter is attached to the carriage immediately in advance of the finishing knife. It reduces the square material to the largest diameter to which it will finish nicely.

The cut off attachment is also fitted to the carriage and travels with it. It stands in a vertical plane and is brought down to its work by a convenient hand lever.



THE DEFIANCE VARIETY TURNING AND BORING LATHE.

Iron," by Godfrey Melland and H. W. Waldron, Mason University College, Birmingham.

"On the Present Position of the Solution Theory of Carburized Iron," by A. Stansfield (London).

"On Iron and Phosphorus. With Appendices on 1, Eutectics; 2, Solid Solutions; 3, Method of Determining Free Phosphide of Iron in Iron and Steel, and 4, Heat Tinting Metal Sections for Microscopic Examination," by J. E. Stead.

### The Defiance Variety Turning and Boring Lathe.

The variety turning and boring lathe designed by the Defiance Machine Works of Defiance, Ohio, is intended to cover a wide range of work. The material from which the work is turned is placed in the machine in short or long pieces, but not exceeding 36 inches at the longest, and is converted into the finished article, bored, turned, polished and cut off ready for use. The design of the turning is governed by the shape of the finishing knife used. It requires a specially shaped knife for each article of different design to be turned. The shape of the turned work which it is desired to make is milled the full length of the knife, so that the exact duplicate of work is always secured; in sharpen-

The tail stock is gibbed and accurately fitted to the top of the frame, central with the head spindle. It is fitted with a large spindle to carry a boring bit to bore holes of different sizes. When work is intended to be bored, the boring is performed before turning is accomplished, leaving the boring bit in the hole while turning, where it acts as a steady rest. For doing work that requires no boring, a cup center is used in place of the bit. The tail spindle is brought to or from its work by a hand wheel.

In operating the machine, the square material to be turned is placed into the chuck while the machine is in motion. No stoppage is necessary either to place in the rough material or to take out the finished product. The piece is first roughed by sliding the carriage forward in a horizontal plane a sufficient distance to suit the length of the article to be turned. The boring is then performed, after which the finishing knife is brought up to the work, which is shaped complete at one movement. The cut off knife is then brought down by hand lever and the finished product is discharged from the machine. The machine will produce from 5000 to 8000 pieces per day, depending upon the size and shape of work and the quickness of the operator. It will turn irregular work 8 inches long and shorter, but plain round work, such as rollers, pins, &c., can be turned up to 36 inches long and from  $\frac{1}{8}$  inch to 3 inches diameter.

## On the Annealing of White Cast Iron.\*

BY CHARLES JAMES.

The paper on the annealing of white cast iron, which I have to present to you this evening, is not based upon laboratory experiments, but is an abstract of results obtained from daily business practice, extending over a considerable period of time. But, though these investigations were made for the guidance of commercial operations, they seemed to be of sufficient metallurgical interest to justify their presentation to you this evening.

The irons used in these operations were all of Bessemer quality, smelted with coke, no charcoal or other special iron being used. The melting furnace charges consisted of a mixture of gray and white irons, of which the following is an average analysis:

	Combined carbon.	Graphitic carbon.	Silicon.	Manganese.	Sulphur.	Phosphorus.
White iron	3.50	0.50	0.50	0.30	0.08	0.08
Gray iron	0.50	3.50	1.30	0.30	0.02	0.03

The charges varied from 15 per cent. to 25 per cent. of white iron, from 50 per cent. to 60 per cent. of gray iron, and from 20 to 30 per cent. of scrap iron from previous meltings. The variations were made in accordance with the variations in the components of the pig iron and the description of casting required. The composition of the charges was regulated by the silicon content, which was made to vary from 1.20 to 0.90 per cent. The higher percentages of silicon were employed when very hot and very fluid metal was required.

The average chemical composition of these mixtures was:

	Per cent.
Carbon	3.40 to 3.80
Silicon	0.90 to 1.20
Manganese	0.35 to 0.30
Sulphur	0.05 to 0.04
Phosphorus	0.04 to 0.03

The iron was sometimes smelted in a cupola, but generally in an air furnace. The air furnace charges were from 3 to 5 tons, and the furnace was preheated to nearly a melting temperature before introducing the charge. The time occupied in melting was usually from three and one-quarter to three and three-quarter hours. As soon as the charge had completely melted the bath was well rabbled, to obtain as complete a mixture as possible. Test pieces 8 inches long and 1 1/4 inches in diameter were then taken, and as soon as the iron had solidified the test pieces were rapidly cooled and broken. They usually showed a gray or highly mottled fracture, and the subsequent operations were conducted accordingly. The fining and final heating of the metal generally occupied from 35 to 40 minutes, and was continued until a similar test piece was obtained free from all traces of gray iron. The casting made from such iron, however, frequently contains some graphite, due possibly to the different conditions of cooling; but this graphite rarely exceeded one-half of 1 per cent., as the following analysis, which is an average from a large number of such castings, will show: Combined carbon, 3.02; graphitic carbon, 0.47; silicon, 0.78; manganese, 0.120; sulphur, 0.05, and phosphorus, 0.04.

The annealing furnace charges varied from 2 to 3 tons, the castings being placed either in the open furnace and the flame and furnace gases allowed to pass uninterruptedly over and between them, or packed in covered boxes of cast or wrought iron. No difference in the results, except as to scale, was to be observed or detected by either chemical analysis or physical tests, provided the heat treatment was conducted so as to compensate for the changed conditions. Castings packed in boxes, being practically solids of the same dimensions as the boxes, require a longer time to attain the same heat condition throughout their mass than do individual castings treated in the open furnace. But, as castings packed in boxes retain their heat for a greater length of time, and as the annealing effect continues for some time after the mass begins to cool, the total time required for either operation is nearly the same.

### The Carbon Change.

The weight of the various castings treated ranged from 1/2 ounce to 2000 pounds and over. The time required to effect the carbon change—to be hereafter described—varied from three and one-half to ten hours from the time the castings had attained their full temperature. The temperature at which the carbon change takes place in castings of this description lies between the melting points of silver and copper, and may, therefore, be approximately taken as 1850 degrees F.

The change in the condition of the carbon, in irons of different composition, occurs at different tempera-

tures. The range of temperature, however, at which the changes take place in different irons is not very great, and is always closely related to and governed by the temperature of their solidification, and this temperature in turn is largely governed by the relative amounts of carbon, silicon, manganese and sulphur contained in the iron. For irons of similar composition the length of time required to complete the annealing effect in any casting depends upon the section area of that casting. Thus, of two castings of similar chemical composition before annealing, but of different sectional areas, the one weighing 53 and the other 1890 pounds, the smaller casting, after three and one-half hours' annealing, had the following chemical composition: Combined carbon, 0.61, and graphitic carbon, 2.83; and the larger casting, after seven and one-half hours' annealing, gave: Combined carbon, 1.65, and graphitic carbon, 1.85. This casting had to be returned to the furnace and subjected to a further annealing of three and one-half hours' duration, after which it approximated closely in chemical composition to the smaller casting.

The change of carbon in castings subjected to the annealing process, though gradual, is co-extensive throughout any given cross section of the casting; no hard center or core of white iron, surrounded by softer metal, having ever been observed in any of the castings examined. No matter at what period the annealing process may have been arrested, the total surface of any fracture always showed a similarity in the condition of the metal, provided the composition of the metal was homogeneous, and the heat treatment had been applied equally to all parts of the casting.

We will now consider the nature of the change or changes that occur in the casting during annealing, and to enable us to do this we will take the analysis of an average casting produced by this process, both before and after annealing:

	Combined carbon.	Graphitic carbon.	Silicon.	Manganese.	Sulphur.	Phosphorus.
Before annealing	2.60	0.72	0.71	0.110	0.045	0.039
After annealing	0.82	2.75	0.73	0.108	0.04	0.039

From these analyses it will at once be seen that the only change effected is one of condition in the carbon, a large proportion of which has passed from the combined into the graphite state. I wish, however, to say that, though for convenience the term graphite is employed in stating the analyses of these castings after annealing, the condition of the carbon—as I shall presently show—differs very materially from graphite, either as found free in nature or as solidified out from gray iron during cooling.

### The Influence of Chemical Composition.

It has already been shown that the relative quantity of combined and graphitic carbon found in any specimen of iron after annealing depends upon the heat treatment it has received in relation to its chemical composition and sectional area. And it now remains to inquire what effect the other components of the iron exert upon the carbon change. This question has been directly investigated only so far as silicon, manganese and phosphorus are concerned. And of these phosphorus can at once be dismissed with the remark that, in all cases, it was found to be inoperative, at least in the small amount in which it was present in these castings.

With respect to sulphur, the investigations are not yet completed, but are still in progress. Both silicon and manganese exert great influence upon the carbon during the annealing process, the presence of silicon being a necessary condition to the carbon change. In low silicon irons it is very difficult, and, in some cases, impossible, to effect the carbon change, no matter how long the iron is exposed to the heat treatment. This fact is strikingly illustrated in the following example:

A casting of about 5-16 inch in thickness and weighing less than 1 pound, and of the following composition: Combined carbon, 2.68; graphitic carbon, none; silicon, 0.42; manganese, 0.05, was subjected to the usual treatment, but after being annealed for three and one-half hours the casting was still hard, and had a white iron fracture, and analyzed: Combined carbon, 1.97; graphitic carbon, none. After a second annealing of three and one-half hours the appearance of the casting was still unaltered, and the analyses gave: Combined carbon, 1.98; graphitic carbon, trace. Subjected to a third annealing of three and one-half hours the casting was still hard and had a white iron fracture, and analyzed: Combined carbon, 1.90; graphitic carbon, 0.14. Thus, after being exposed for ten and one-half hours to the full annealing temperature, as well as passing three times through the much longer period of heating and cooling, only 0.14 of 1 per cent. of the combined carbon had been changed to the graphite state. In the example just given, both carbon and manganese, as well as silicon, are comparatively of low percentage.

\* A paper read before the Franklin Institute, Philadelphia.



In the following instance, however, the carbon and manganese are both of fairly high percentage, but the casting, after repeated annealings, analyzed: Combined carbon, 1.76; graphitic carbon, 1.08; silicon, 0.31; manganese, 0.126, and the iron remained hard and white, and could not be machined. Indeed, the relative amount of carbon that can be changed from the combined to the graphite state during annealing seems to be directly proportionate to the amount of silicon present, as indicated by the following example, in which all three samples were taken from the same cast, annealed in the same furnace at the same time and under identical conditions:

No.	Combined carbon.	Graphitic carbon.	Silicon.	Manganese.
1.....	1.49	1.40	0.56	0.126
2.....	1.57	1.33	0.45	0.130
3.....	1.87	1.03	0.31	0.126

In this instance the total carbon and the manganese are practically the same in all three examples, and of comparatively high percentage, the silicon being the only variant, except the condition of the carbon, which is less and less changed as the silicon in the iron decreases.

That low carbon, or at least comparatively low carbon, does not prevent the change in the carbon condition taking place seems well illustrated in the following example of a comparatively low carbon iron subjected to three and one-half hours' annealing:

	Combined carbon.	Graphitic carbon.	Silicon.	Manganese.
Before annealing..	1.94	none.	0.64	0.09
After annealing...	none.	2.00	0.62	0.110

In this instance the percentage of silicon is slightly under the normal amount usually present in this class of castings, while the manganese is well up to its average in such castings.

The influence of the manganese on the carbon change is not nearly so marked as that of silicon, and its action is further obscured by the high silicon which always accompanies high manganese, for as the percentage of manganese rises in the casting the percentage of silicon rises also. Comparatively high manganese, however, assists the carbon change and shortens the time necessary for its completion. This is illustrated in the following analyses of a high manganese casting after being annealed for three hours only:

	Combined carbon.	Graphitic carbon.	Silicon.	Manganese.
Before annealing..	3.68	none.	0.93	0.30
After annealing...	none.	3.62	0.95	0.31

In this instance the casting shows signs of over-annealing, and the process had evidently been carried on much longer than was necessary.

The action of silicon and of manganese upon the carbon change is apparently of an essentially different character, that of silicon being direct upon the carbon, compelling it to change its condition, while the influence of the manganese is only indirectly upon the carbon through the silicon by protecting the latter from oxidation during the melting of the iron, thus causing the percentage of the silicon in the casting to be higher than it would be if the manganese had itself been more completely oxidized from the bath. This also accounts for the fact that comparatively high silicon and comparatively high manganese and the reverse are always coincident.

#### Low Silicon Low Manganese Irons Worthless.

In every case, however, irons low in silicon and manganese are practically worthless after annealing. Such irons may be softened by the process, so as to machine easily, but are always deficient in tenacity. They generally have a white fracture, in appearance like that of a 30 per cent. carbon Bessemer steel bar. The analyses, after annealing, of two such irons are given for comparison:

No.	Combined carbon.	Graphitic carbon.	Silicon.	Manganese.
1.....	2.65	none.	0.46	trace.
2.....	1.97	none.	0.42	none.

The analysis shows that there was no change of the carbon conditions during annealing. The samples machined easily, but broke to pieces under the pressure of the lathe tool.

#### Annealing Tool Steel.

That this change of carbon, from the combined to the graphite condition, can be produced by this method of annealing in other combinations of iron and carbon, as well as in white iron castings, is proved by the following experiment carried out upon a hammered bar of crucible tool steel, which analyzed before annealing: Combined carbon, 0.97; graphitic carbon, none; silicon, 0.32; manganese, 0.31. After four hours of annealing the sample exhibited only the appearance of well annealed tool steel, except that a skin of bright iron, simi-

lar to that seen around some malleable iron castings, had appeared. After a second annealing for four hours, the bright skin had deepened into the bar, and the remaining portion of the cross section had a leady appearance. After a third annealing of four hours, the bright skin had increased still more in depth, and the remaining portion of the cross section had become black with graphite carbon, some bright spots, however, still being visible. The bar then analyzed: Combined carbon, 0.47; graphitic carbon, 0.42; silicon, 0.38; Manganese, 0.30, showing that nearly 50 per cent. of the carbon had changed its condition, the loss of carbon shown by this analysis being due to the decarbonizing of the surface of the bar.

#### Nature of Carbon After Annealing.

Lastly, we have to consider the nature of the carbon found in the castings after annealing. The carbon thus formed is evidently identical with what Ledebur has called "tempering graphite carbon," and is an allotropic form of graphite, and not merely amorphous carbon, since I find, by experiment, that it differs from both these varieties of carbon in its specific gravity, specific heat and calorific power, which after careful examination I find to be as follows:

Specific gravity.....	1.9 as compared to water.
Specific heat.....	0.2237
Calorific power.....	7803 heat units.

That this allotropic form of graphite should have been mistaken for a graphite similar to that of gray cast iron, though it has none of the bright scaly luster of the latter, is not surprising, since it can be both separated from the iron and chemically determined in the same manner as the graphite from gray iron, though its combustion is much more difficult.

The chemical and physical condition attending the formation of this allotropic graphite during the annealing process, and its probable molecular form, as well as the position it occupies in the structure of the casting, which differs so remarkably from the position occupied by graphite in gray iron, have already been described in a paper read by me before this section in 1897. And I need not now refer to this part of the subject, further than to say that the change, as at that time pointed out, affords a striking example of the solution of one solid in another, at temperatures below the melting point of either.

Contrary to Ledebur's statement, that "tempering graphite carbon" is unaffected by the hardening process, I find that iron containing this allotropic graphite hardens and tempers excellently well, and that when not fully developed by over long annealing the whole of this carbon will pass into the hardening state and leave the iron without a trace of free carbon. I also find that, by prolonged heating, this allotropic form of graphite becomes changed to graphite identical with that found in gray iron, and that it then occupies a similar position in the iron structure, and greatly injures its physical qualities, so that overannealing should at all times be carefully avoided.

Some interesting experiments on the use of aluminum line wire for long power transmission lines are reported in a paper read by F. A. C. Perrine and F. G. Baum before the American Institute of Electrical Engineers, and published in its Transactions for June and July. As compared with copper, on the basis of the same conductivity, the diameter of aluminum wire is 1.27 and the area 1.64 times greater. The tensile strength is 0.629 that of copper and the weight 0.501 of that of copper.

It is announced that the United States Radiator Company of Dunkirk will soon erect a large new factory in Dunkirk, N. Y. An expenditure of \$200,000 is contemplated. The new plant will include a foundry, machine shop, erecting room, supply and office buildings. The claim is made that it will be the largest radiator works in the world, and that the manufactured product will be increased three times over what it is at present.

At a conference of officials of the Republic Iron & Steel Company and the American Sheet Steel Company, held this week at Sharon, Pa., it was decided, a local report states, to move the Sheet mills from the Sharon works to Vandergrift, Pa. The Sheet mills at Haseltown, Youngstown and Cincinnati, Ohio, will also be moved, it is said, with the object of consolidating the industry.

What is said to be the largest annealing furnace in the United States has just been completed for the American Tin Plate Company's works at Niles, Ohio. It will do the work of ten ordinary furnaces. The new furnace is 68 feet long, 18 feet wide and 10 feet high.

### Brass Made from Copper Containing Suboxide.

Erwin S. Sperry of Bridgeport, Conn., has brought before the American Institute of Mining Engineers another of his valuable papers embodying his experimental work on the properties of brass and copper. In this latest he notes the results of experiments made to ascertain the properties of copper containing suboxide and of brass made from copper containing oxygen. Mr. Sperry makes the following general conclusions:

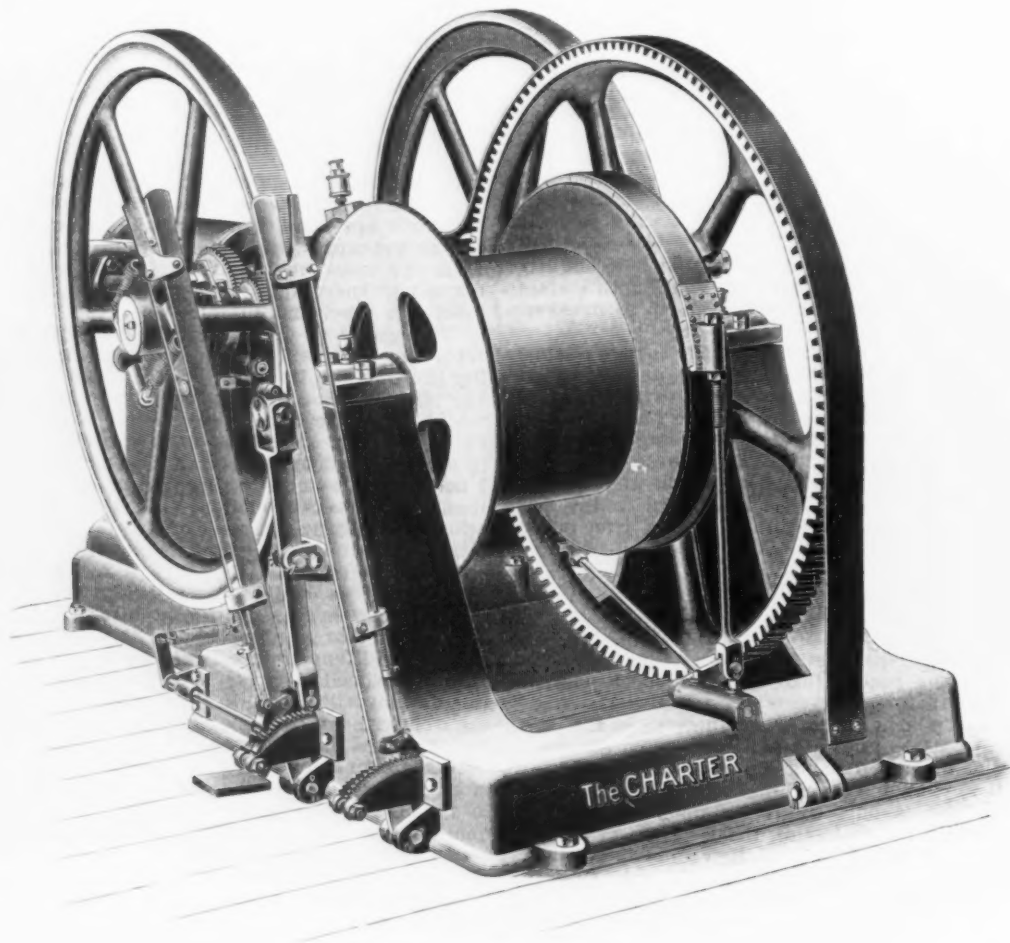
It is believed that the experiments demonstrate that oxygen in copper, unless present in abnormally large amounts, does not exert a deleterious influence on the quality of brass intended for rolling into sheet. If oxygen is present in excessive amounts (quantities seldom occurring in practice unless the melter is lax in his methods), salamanders are apt to form. If it is present in less amount, salamanders may not form, but the brass manifests a tendency to crack in rolling. This is due,

gen in copper may be quite minute, and not sufficient to exert any influence on brass, yet if the caster is not cautious, and neglects the frequent additions of charcoal, this small percentage may be increased many times by the oxidizing influence of the atmosphere.

In conclusion it may be said that, unless the amount of oxygen in commercial copper exceeds the figure given above, it cannot, *per se*, be called an injurious impurity.

### The Charter Gas Engine Hoisting Machine.

The accompanying engraving shows a Charter engine combined on one base with a hoisting drum, for use in mining, loading and unloading vessels, or for any purpose for which steam hoists are used. The machine is provided with a friction clutch that is easily operated, and is constructed so there is no end pressure on the journals when the load is being hoisted. Means are provided for



THE CHARTER GAS ENGINE HOISTING MACHINE.

no doubt, to the zinc oxide present, which prevents perfect cohesion. From still smaller quantities of oxygen practically no injury is noticed. The proportion may even be as high as 0.55 per cent. and no adverse results happen; but more than ordinary care must be exercised to keep the metal thoroughly covered with charcoal.

The amount of oxygen in commercial copper is more or less variable, depending upon the caprices of the refiner; but in the best brands great care is taken to keep within as narrow limits as possible. The pitch, of course, determines this point.

According to advices received in personal communications from chemists representing two leading brands of copper on the market (one Lake and the other Electrolytic), the amount of oxygen which exists in these brands of copper may be taken as follows:

	Lake.	Electrolytic.
	Per cent.	Per cent.
Oxygen contained in ingot copper.....	0.012	0.010

On a careful perusal of the results of the various experiments enumerated above, it may be readily seen that no injurious influence can possibly be exerted by such a small proportion of oxygen as 0.01 per cent. Good sheet brass was made from copper containing over 50 times this quantity. Although the initial amount of oxy-

taking up the wear of the clutch shoes. With the aid of a powerful brake the load can be held at any point or lowered at will. A speeding device is furnished, operated by the treadle shown in the cut, with which the operator can vary the speed of the engine through a wide range, thus enabling the load to be picked up easily, and the speed then increased as rapidly as may be desired. The hoist is made to be operated by either gas or gasoline engine, by the Charter Gas Engine Company of Sterling, Ill.

The expansion in national bank circulation as the result of the enactment of the new financial law of last March is now on a greatly reduced scale. The monthly Government statements show that during August the net addition to the volume of circulating notes was \$4,208,454. The movement has been on a gradually diminishing scale since its inception, and the increase of \$4,208,454 for August compares with \$10,455,637 for July, \$9,070,830 for June, \$15,210,563 for May, \$14,325,258 for April and \$21,518,190 for March. Altogether the net addition in this way since March 1 last has been almost \$75,000,000, the total of outstanding notes now (September 1) being \$324,222,810, against \$249,434,878 on March 1 last.



### The Duty on Stubb's Drill Rods.

The United States General Appraisers have rendered the following decision in the protests of the Standard Tool Company and the W. Bingham Company against the decision of the Collector of Customs at Cleveland on goods imported in 1899 and 1900:

The merchandise consists of tempered and polished steel rods or bars, about 36 inches in length. They were assessed for duty at 4 7-10,  $\frac{1}{4}$  cent per pound, and at 45 per cent. ad valorem under paragraphs 135, 137 and 141 of the tariff act of July 24, 1897, and are claimed to be dutiable at  $\frac{3}{4}$ ,  $\frac{1}{4}$  and  $\frac{1}{2}$  cent per pound and 40 per cent. ad valorem under the provisions of paragraphs 136, 137 and 141 of said act.

The pertinent provisions of the paragraphs under which the assessments were made are as follows:

"135. . . . Steel in all forms and shapes, . . . valued above 16 cents per pound, 4 7-10 cents per pound.

"137. . . . Iron or steel or other wire, . . . valued at more than 4 cents per pound, 45 per cent. ad valorem.

"141. On all iron or steel bars or rods of whatever shape or section which are cold rolled, cold drawn, cold hammered, or polished in any way in addition to the ordinary process of hot rolling or hammering, there shall be paid one-fourth of 1 cent per pound in addition to the

was reversed by the Circuit Court for the Southern district of New York (94 Fed. Rep., 483), Townsend, J., in the following language:

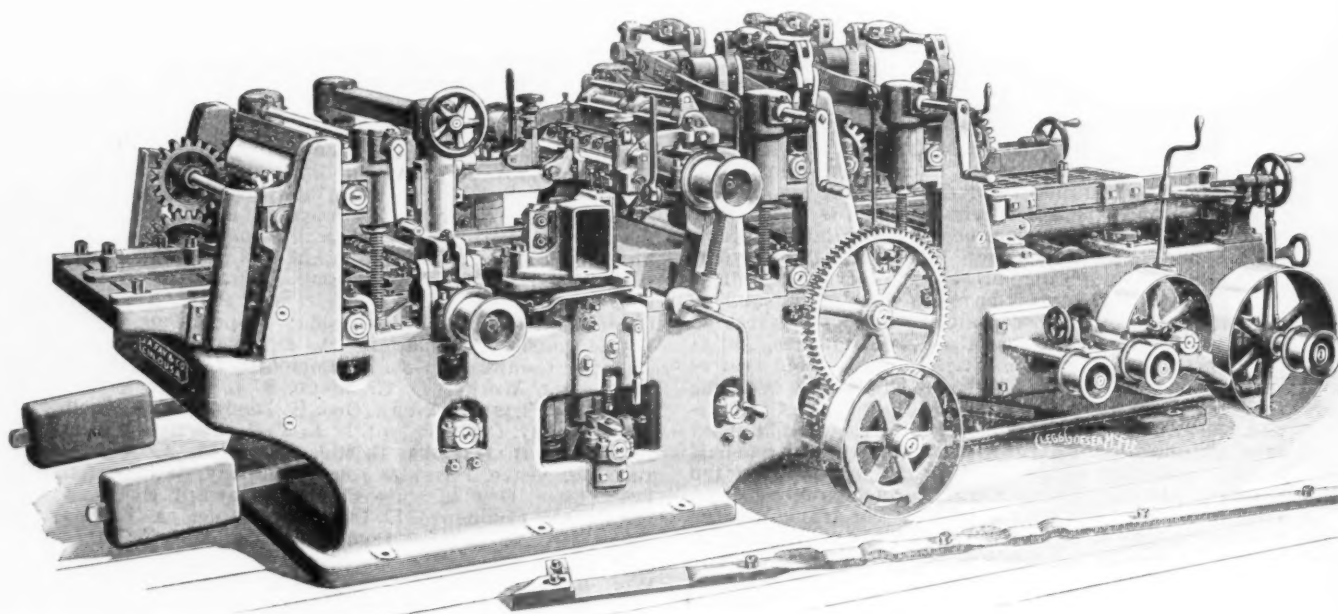
"It is established through uncontradicted testimony that these articles have gone through the processes which are essential in the making of wire, and which are essential to fit them for the making of drills, and that they have been cut into appropriate lengths; and it is abundantly established by the evidence of manufacturers, as well as dealers, that they are commercially included within the class of wires or wire, and are commonly known as 'drill rods.' Inasmuch as they are also steel rods for making drills, and therefore drill rods in fact, the decision of the Board of General Appraisers is reversed."

Under the act of 1894, paragraph 124, there appears a special provision for drill rods; but in the act of 1897 this provision by special enactment has entirely disappeared, and such merchandise is now provided for in the wire schedule under paragraph 136.

We find, therefore—

1. That the steel rods smaller than No. 6 wire gauge are dutiable at 40 per cent. ad valorem and  $\frac{3}{4}$  cent per pound under paragraphs 136, 137 and 141 of the act of 1897.

2. That the steel rods not smaller than No. 6 wire gauge are, therefore, not covered by any provision of



THE FAY & EGAN PLANER, MATCHER AND JOINTER.

rates provided in this act on bars or rods of whatever section or shape which are hot rolled; . . ."

Upon the hearing of the case before the board same was submitted without testimony.

The importers base their contention for refund on the steel bars or rods which are less than No. 6 wire gauge, on that portion of paragraphs 136 and 137 which reads as follows:

"136. . . . Provided, That all round iron or steel rods smaller than No. 6 wire gauge shall be classed and dutiable as wire: Provided further, That all iron or steel wire rods which have been tempered or treated in any manner or partly manufactured shall pay an additional duty of one-half of 1 cent per pound.

"137. Round iron or steel wire . . . : Provided, That all the foregoing valued at more than 4 cents per pound shall pay a duty of 40 per cent. ad valorem."

The importers state that this merchandise is known as "Stubb's steel," and is imported as steel rods and wire for use in the manufacture of drills, and is drill rods.

In their protests they cite various decisions and rulings in support of their contention and particularly rely upon the ruling laid down by the board in G. A. 3044. In that case the merchandise consisted of bright steel rods, not smaller than No. 6 wire gauge, and was assessed with duty at 40 per cent. as drill rods under paragraph 124 of the act of 1894, and were claimed to be dutiable under paragraph 122 of said act as "steel in all forms and shapes;" and in the case now under consideration the importers take the very opposite position taken by the protestants in G. A. 3044.

Upon appeal, the decision of the board in G. A. 3044

the wire schedule, and are dutiable at 4 7-10 cents per pound, as steel in all other forms and shapes, under paragraph 135, with the additional rate of  $\frac{1}{4}$  cent per pound provided for under paragraph 141 for "all iron or steel bars or rods, . . . polished . . ."

While the importers claim that the merchandise is "valued above 4 cents per pound," no testimony was offered showing the exact value, and the Collector in his return assessing duty on the merchandise covered by our second finding, as being valued above 16 cents per pound, is presumptively correct, and his decision will stand. The merchandise is steel rods and not wire rods, and is not smaller than No. 6 wire gauge. It is, therefore, dutiable as assessed under the provisions of paragraph 135, for steel in all other forms and shapes not specially provided for, with the additional rate of duty of  $\frac{1}{4}$  cent per pound as provided for polished steel rods under paragraph 141.

The Collector's decision is reversed to the extent as set forth in our findings, with instructions to reliquidate the entries on that basis.

### The Fay & Egan Planer, Matcher and Jointer.

What is claimed to be the largest and heaviest six-roll double cylinder planing, matching and jointing machine, has just been completed by the J. A. Fay & Egan Company of Cincinnati. It is intended for railroad car and repair shops and large planing mills. It will plane 30 inches wide and 14 inches thick, and will work simultaneously three sides of two pieces of material of uneven thickness up to 12 inches wide and 14 inches thick. The frame is perfectly jointed and bolted to secure rigid-

ity. The cylinders are made of forged steel, and are slotted on all their faces. The matching works are fitted with a weighted matcher clip for working cross grained and knotty lumber and produce accurate work rapidly. The feed works consist of six rolls 8 inches in diameter, connected by a train of expansion gearing, with double links, and are heavily weighted.

### The Armor Plate Matter.

WASHINGTON, D. C., September 11, 1900.—It was stated at the Navy Department to-day that the tangle in which the armor plate matter has become involved would be straightened out immediately after the return to this city of Admiral O'Neil, Chief of the Ordnance Bureau, who is expected here the latter part of this week. Secretary Long will also return in a few days, but it is understood that the Secretary and the Chief of Ordnance have recently conferred with regard to the matter, and that the latter is authorized to take steps to adjust the controversy.

No official of the Department ventures a prediction as to the manner in which the solution is to be reached. The Department is still advertising that proposals will be received for 36,000 tons of armor on October 2, and that full particulars may be had upon application, but, although the advertisement is dated August 13, and more than one-half the period before the opening has elapsed, the circular setting forth the new allotment is still said to be "in course of preparation." It seems altogether probable that in the event that the appeal of the Midvale Steel Company against the rejection of the bids opened August 10 is overruled, a later date than October 2 will have to be set for the reception of new bids.

In the meantime, considerable anxiety is felt in the Construction and Engineering bureaus concerning the armor for the "Maine" and class, which amounts to about 7200 tons, the great bulk of which is designed to be treated by the Krupp process. The latest reports from Cramp's, the Union Iron Works and the Newport News Shipbuilding Company show that the "Maine," "Ohio" and "Missouri" have reached 34, 28 and 12 per cent., respectively, of completion. As progress on these vessels averages about 4 per cent. a month, and as the Construction Bureau has heretofore insisted that at least a part of the plates of a battle ship should be in the shipyard when the vessel reaches 50 per cent. of completion, the armor of the "Maine" will be required in about four months, that of the "Ohio" in five and one-half months and that of the "Missouri" in less than ten months. Allowing liberal margin for delays in construction, it will be seen that a part of the armor for the "Maine" ought to be on hand within six months, and a portion of that of her sister ships within a year. The proposals submitted on August 10, however, contemplated no deliveries within six months of the signing of the contracts, and limited deliveries to a total of 600 tons per month thereafter, including both Carnegie and Bethlehem bids. Under present conditions, and especially in view of the difficulties recently encountered, the Department anticipates considerable delay in getting this armor, and does not expect to be able to meet its engagements with the ship contractors.

In the contracts for the three battle ships a clause was inserted, under which the Government agreed to deliver armor when a certain stage of completion was reached, and it is already out of the question to meet this condition. The result will not be, as has been erroneously stated, to mulct the Government in damages for the delay, but, what amounts to the same thing, it will operate to release the contractors from all liability to deliver the vessels within the periods stipulated in the contracts. No matter how brief the delay by the Government the contract is so drawn that the shipbuilder may thereafter take his time in finishing his ship, and thus delivery may be indefinitely postponed. Unless the whole armor plate question is satisfactorily settled before bids are opened for the new battle ships for which proposals have been asked, a modified form of contract is likely to be provided to meet the contingency of indefinite delay in providing armor.

The hasty action taken in rejecting all the bids opened on August 10 and the inability of bureau chiefs to secure any information concerning the probable course of the Department has caused no little irritation among those responsible for the progress of the work on the new ships. A prominent official of the Department, in discussing the situation, said to the correspondent of *The Iron Age*:

"No more extraordinary action has been taken in this Department than the rejection of the armor plate bids involving \$13,000,000 or \$14,000,000, without even soliciting the views of any official of either the Construction or the Engineering bureaus. Action seems to have been based solely upon the recommendation of the Ordnance

Bureau, a bureau that has no official knowledge of the condition of the ships under construction and can, therefore, know nothing about their immediate needs. To readvertise for bids under the circumstances seems to be a waste of time, and I believe that under the broad discretion possessed by the Secretary he is at liberty to negotiate with the three bidders, with a view to dividing up the entire amount of armor in some equitable manner, and, if necessary, invoking his authority to construct a Government plant to bring them to terms. It seems quite unlikely that the Carnegie and Bethlehem companies will oblige the Government by making 7200 tons of armor for the "Maine" and class for the sole purpose of permitting the Midvale Steel Company to enter the competition, yet if they decline, what can the Government do? Under the law we cannot buy a ton of this armor abroad, and the Carnegie and Bethlehem companies are the only concerns that can furnish it within three or four years.

"This whole controversy, to my mind, emphasizes the great superiority of the method followed by certain leading European powers in contracting with the shipbuilder for the complete vessel, leaving him to procure his armor where he can. The physical and ballistic tests required protect the Government and no controversy can arise over price or any other feature of the matter. Under our present system the armor matter becomes annually a football for the politicians in Congress, and it is hardly to be wondered at that the administration so frequently finds its hands tied." W. L. C.

### The Foundrymen's Association.

The one hundredth meeting of the Foundrymen's Association was held at the Manufacturers' Club, Philadelphia, Pa., Wednesday evening, September 5, the vice-president, J. S. Stirling, occupying the chair.

There was a large attendance of members, among whom were the following: J. S. Stirling, Harlan & Hollingsworth Company, Wilmington, Del.; Walter Wood, R. D. Wood & Co.; R. W. Trump, Philadelphia Stove & Iron Foundry; Geo. M. Blankert and P. H. Redmond, G. Rebman & Co., Philadelphia; ex-president of the Foundrymen's Association, P. D. Wanner, Reading Foundry Company; Geo. R. Lombard, Lombard Foundry & Iron Works; D. G. Moore, S. L. Moore & Sons Company, Elizabeth, N. J.; Geo. H. Davis, Crown Smelting Company, Chester, Pa.; L. L. Tack, Bucharest, Roumania; T. B. Harkins, Bristol, Pa.; Geo. A. Messick and Jno. Neave, Pusey & Jones Company, Wilmington, Del.; Chas. Griffin, State College; Howard Evans, J. W. Paxson Company; E. Oscar Hauptner, A. C. Pessano, Geo. V. Cresson Company; Mr. Dreyfus, Daylight Prism Company; G. Stahl, Girard Iron Works; Wm. Kuemmerle, Jr., Greger Mfg. Company; M. T. Carr and A. G. Warren, J. W. Paxson Company; L. A. Hickley, Davis Coal & Coke Company; G. T. Holbrook; T. B. Rohman; H. O. Evans, Thomas Devlin & Co.; W. H. Pfahler, Abram Cox Stove Company; E. J. Etting and F. C. Price, E. J. Etting & Co.; C. S. Kock, Wm. Sellers & Co.; Geo. C. Davis, American Pig Iron Storage & Warrant Company; Walter L. Taylor, Tioga Foundry Company; Geo. C. Davies, Pilling & Crane; C. Hitzeroth, C. Hitzeroth & Son; P. Van Fleet, T. A. Sheppard & Co.; C. H. Newcomb, Matthew Addy & Co.; Wm. Hanson, Pennsylvania Iron Works Company; Thomas Hobson and August A. Miller, *The Iron Age*, all of Philadelphia.

The minutes of the previous meeting were disposed of in the usual manner.

The report of the treasurer showed the association to be in good financial condition.

J. K. Dimmick & Co., pig iron merchants, Philadelphia, Pa., and E. C. Stearns & Co., hardware manufacturers, Syracuse, N. Y., were recommended by the Executive Committee and elected to membership.

E. H. Mumford, Elizabeth, N. J., was to have read and demonstrated his paper, "The Problem of Machine Molding," which we print elsewhere. He was, however, unavoidably detained and the paper was read by A. A. Miller.

Considerable discussion followed the reading. Mr. W. H. Pfahler stating, in the course of his remarks, that "the molding machine would be the solution of the foundrymen's difficulties and prove eventually his main safeguard." J. S. Stirling, Howard Evans, H. O. Evans, D. G. Moore, Geo. A. Messick and A. C. Pessano also took part in the discussion.

Owing to the interest developed in the discussion it was declared the sense of the association that the manufacturers of molding machines should be invited to appear before the association and demonstrate by paper and, if possible, by means of lantern slides, the features and working details of the various machines.

G. R. Lombard of Augusta, Ga., made a few remarks



on the condition of the foundry trade in the neighborhood of Augusta. He stated "that, generally, foundries had plenty of work on hand. They are having no difficulties with their men. Molders command from \$2 to \$2.50 per day and are satisfied. The amount of work, however, which the men put up for a day's work is not as large as is done by the molders in the North and West."

The meeting, on motion of A. C. Pessano, adjourned and the members proceeded to the roof garden, where luncheon was served.

Howard Evans, acting as toastmaster, made a few remarks and introduced Count L. L. Tack of Bucharest, Roumania, who thanked the members of the association and the foundrymen and steel masters of this district for the kindness which has been shown him. He, being interested in the various methods of melting iron and steel, and particularly with oil as the fuel, had visited a large number of works and had gained much knowledge. Count Tack returns to Bucharest grateful and pleased with the treatment of the American foundrymen.

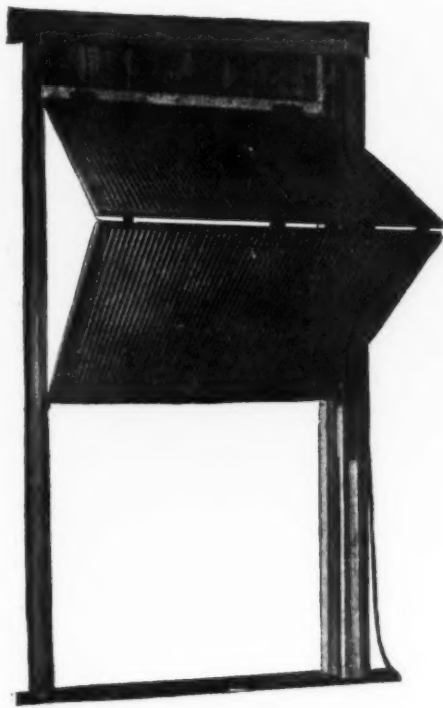
Ex-President P. D. Wanner of Reading, Pa., followed

of the frame and connecting with the lower section at the lower corners. When closed the door is fastened at the middle by an ordinary double bolt or latch working from the center. The space required for the operation of the door, of course, varies with the height. Boxes 2 feet 11 inches in height, for instance, can be placed 1 foot back from the door without interference, while with a clearance space of 2 feet the path of the door is unobstructed to a height of 4 feet 3 inches.

### The Protection of Blast Furnace Linings.\*

BY S. S. HARTRANFT, BUFFALO, N. Y.

Furnacemen of the present day agree very nearly as to the best cooling devices for the protection of blast furnace hearths and boshes, and the best location of the cooling system in the brick work for the maintenance of favorable furnace lines throughout the blast. The replaceable bronze and copper plates are practically faultless, and there seems to be no reason why a fur-



Partly Closed.



Open

THE CROSS HORIZONTALLY FOLDING DOOR.

and spoke of the condition of the foundry business generally, after which the social session came to a close.

### The Cross Horizontally Folding Door.

A horizontally folding door, particularly adapted for freight stations, warehouses and like structures, has been designed by the Variety Mfg. Company, 54-60 North Clinton street, Chicago. It is constructed of corrugated sheet metal, in two equal parts, each part having a frame of angle iron. The two parts are hinged together at their line of meeting across the middle of the doorway, and the upper half is hinged at the top to the framework. The lower corners of the lower half are provided each with an anti-friction roller, which in operation runs upon a metal strap attached to the frame of the doorway, and this section is held in place by lips, which engage with a rabbet formed in or behind the metal straps, which thus serve as guides upon which the section slides. The door sections are counterbalanced by a weight, and the labor required for working in either direction is only the exertion of sufficient raising or lowering force to overcome the balance. The door is easily opened or closed with one hand. The engravings show at the right hand a chain which may or may not be used, according to the height of the door. This is connected to the counterbalance weight, and passes over a pulley for the purpose of raising the weight and allowing the door to close by gravity. The connection between the counterbalance and the door is made by chains also passing over pulleys at the top

nace hearth and bosh should not be held in good condition, by intelligent management and the use of replaceable plates, for a period several times the length of the average blast of to-day.

While furnacemen have taken these precautions to protect the hearth and bosh beyond the life of the lining, the portion of the lining above the mantle has been partly protected by some and wholly neglected by others. Some would not construct a furnace without mantle plates, and others would not construct a furnace with them. In most cases furnacemen have either trusted to Providence or to the bosh plates for the continuance of favorable working conditions above the mantle and the prolongation of the life of the lining; consequently furnaces are constantly blown out for repairs to the lining, or for relining, when the hearth and bosh are in good enough condition to last through another blast.

The following extract from one of James Gayley's contributions on American blast furnace practice is of interest in this connection:

"One point particularly worthy of mention has been observed recently, viz.: That the removable bosh plates of bronze and copper protect not only the bosh wall, but also the whole of the upper lining, from the point where the stock strikes against the top lining down to the mantle. The wear of the lining for double the production is only about half what it was when the bosh was protected differently. The result, as amply demonstrated by practice, is that the fuel consumption does

\* A paper read before the American Institute of Mining Engineers.

not increase with the length of the blast, as has been the usual experience; and it also follows that the production maintains its regularity." \*

In other words, according to Mr. Gayley's statement, the melting and wearing away of the lining to large diameter above the mantle is retarded so as to increase the economical working life of the furnace 100 per cent. The working life of a furnace depends upon the ability of the lining, from the stock line to the mantle, to withstand melting or wearing away, which causes extravagant fuel consumption and irregular working. Consequently, it seems that furnacemen should endeavor to ascertain the lines necessary to insure good economical working conditions, and to protect these lines as the hearth and bosh are protected, thereby making the life of the lining from the mantle to the top equal to the life of the hearth and bosh.

F. E. Bachman, my predecessor in charge of the Buffalo Furnace, informs me that the furnace, as put in blast in 1895, had the following dimensions: Diameter of hearth, 11 feet; diameter of bosh, 18 feet; angle of bosh, 75 degrees; and that it was provided with replaceable copper plates up to the mantle, and three rows of double pipe cast iron plates of the ordinary type above the mantle. The inner  $1\frac{1}{4}$ -inch pipe was  $2\frac{1}{2}$  inches from the inner edge of the plate, and the outer  $1\frac{1}{4}$ -inch pipe was 6 inches from the inner pipe, and parallel to it, both running lengthwise through the plate, which was 8 feet in length. The first row of these plates was placed 5 inches above the mantle, with the front edge of each plate  $4\frac{1}{2}$  inches from the inside line of the brick work; the second row was  $2\frac{1}{2}$  feet above the first, with the front edge of each plate 9 inches from the inside line of the brick work; and the third row was  $2\frac{1}{2}$  feet above the second, with the front edge of each plate  $4\frac{1}{2}$  inches from the inside line of the brick work.

After blowing in, the furnace worked very well for the greater part of the first year, when it began hanging and slipping, which gradually became so pronounced as to interfere materially with the grade of the iron. About the end of the first year the water circulation was lost on the inner pipes of the three rows of plates above described, after which there was no more hanging and slipping, while the grade of the iron improved and the output increased. In about a year and a half from the time the inner rows of pipes were lost the outer rows were lost also and, there being no water protection left, the furnace soon enlarged at this point to such an unfavorable diameter and shape that it became necessary to blow out at the end of the third year.

On several occasions I have cut the water off from the inside pipes in three or four of the upper rows of bosh plates, usually after the furnaces had been in blast a year or more and the inner pipes had been lost in a few of these plates. A quick and favorable response was invariably noticed, in the way of improvement in grade and increase in output.

The ledge or offset that forms above the upper row of plates by the wearing away of the brick work from the original lines interferes with the regular descent of the stock in proportion as it grows larger; the effects of which (when the plates are placed, as is customary, with the front edge of each a few inches from the inside line of the brick work) are generally noticeable about the middle of the blast. I think that the wearing away of the lining could be sufficiently retarded to insure the retention of favorable lines, through the period of an average blast, by six rows of plates above the mantle, placed  $2\frac{1}{2}$  feet apart, with their front edges at least 9 inches from the inside line of the brick work.

It has been the experience of some furnacemen, who place plates above the mantle and extend them through the lining until the front edge of each plate is within a few inches of the inside of the brick work, that the furnace does better work when the first row of pipes in the plates burns off and the diameter of the furnace enlarges until the second or rear row of pipes prevents further enlargement in diameter. When the last row of pipes in these plates burns off, and all protection is lost, a further enlargement in diameter causes extravagant fuel consumption and irregular working, to such an extent that it becomes necessary to blow out the furnace and put in a new lining. It seems, therefore, from experience with these plates, that in a furnace of modern lines, to secure the protection of plates and the retention of favorable lines for a period more nearly approaching the life of the hearth and bosh, the plates should be placed with the front edge from 9 to 12 inches from the inside of the brick work. This will permit an enlargement of diameter of from 18 to 24 inches without destruction of the plates; and if the furnace can be held by the plates after this increase in diameter, a blast of regular work somewhat longer than ordinary might be expected. Plates set back from 9 to 12 inches from the inside of the brick work would not suffer so

much from heat and abrasion, and would, no doubt, hold out for a much longer period than when placed according to the present custom. The construction might be such as to permit replaceable plates similar to the present replaceable bosh plates; and when the most favorable lines to which the furnace should be held above the mantle had been determined, these plates could be placed with their front edges as close to the inside line of the brick work as many furnacemen place their bosh plates at the present time.

I have had an opportunity recently to observe the result of fitting up a furnace with rows of solid cast iron plates at the stock line, and I am much pleased to find how well these plates, with an inner edge 5 inches wide, placed in rows 1 foot apart, have worn, and have protected the lining at this point. I would not be surprised to see, before long, furnace stacks plated from the mantle to a point above the stock line with water plates and solid plates. The only question difficult to decide will probably be the point in the ascent at which the water plates should stop and the solid plates begin.

Considering the great progress of furnace practice in recent years, especially in the matter of the protection given to furnace hearths and boshes, it seems that the linings from the mantle up have not had a corresponding share of protection, and that in the near future this portion of the stack will be equally protected with the hearth and bosh from the effects of heat and abrasion, so that a great increase in the length of blasts, or the amount of iron made on one lining, may be expected.

### Wages in Union Sheet Mills.

Last week we quoted some figures relative to the wages in sheet mills from a letter published by George Powell, president of the Tin Plate Workers' International Protective Association. The *Labor Tribune* has since printed a communication from a man in the employ of the sheet mill at Middletown, Ind., from which we quote the following:

"When an official of any labor organization undertakes to write an article for the press (our own included) he should be sure of the ground he is on. Here is Mr. Powell's scale of wages:

	Per day.
Roller.....	\$13.00
Doubler.....	8.50
Heater.....	7.88
Catcher.....	3.80
Average.....	\$8.30

"Now I will try and show Mr. Powell where he is wrong. I will take my own mill. I hire a rougher, as the work is too hard for any one man. I pay him \$3.25 a day. My doubler has a pair puller. (All the doublers have the same in this mill.) He pays him \$1.50 a day. (Some receive as much as \$2.) I have two heaters, and I don't believe there is a man in the country that is doing a heating job alone. But we will say that the heater has a helper, and he gets \$2 a day. My catcher gets 23 per cent. of my wages. My single boy gets 30 cents a day from me, 30 cents a day from the doubler, and 49 cents per ton from the company for 30 G. We will see the difference, taking 5740 pounds, 30 G., as the output:

Roller, 5,740 pounds, 30 G.....	\$15.90
23 per cent. for catcher.....	\$3.50
Single boy.....	30
Rougher.....	3.25

7.05  
\$8.25

Only \$4.75 difference.

Doubler, 5,740 pounds, 30 G.....	\$17.90
Pair puller.....	\$1.50
Single boy.....	30

1.80

Heater, 5,740 pounds, 30 G.....	\$6.10
Helper.....	\$7.25
	2.00

\$5.25

Catcher, 5,740 pounds, 30 G.....	\$3.50
Single boy, 5,740 pounds, 30 G.....	\$1.30
From roller.....	30
From doubler.....	30

\$1.90

Roller.....	\$8.25
Doubler.....	6.10
Heater.....	5.25
Catcher.....	3.50
Rougher.....	3.25
Single boy.....	1.80
Pair boy.....	1.50
Heater's Helper.....	2.00

Average, \$8.96 $\frac{1}{4}$  for eight hours.

"On large mills they may be 5 per cent. in excess of the limit, but 5740 pounds of 30 G. would be a good average for our six-mill plant."

\* Trans., xxiv, 759.



### The Heyl & Patterson Reciprocating Conveyors.

In the reciprocating conveyor built by Heyl & Patterson of Pittsburgh, the only moving part in contact with the material is the flight, which is comparatively inexpensive and can be readily replaced. Openings and

the least amount of metal; special couplings permit of quick and accurate assembling. The pipe is supported by guide frames, which fix the position of the pipe vertically and make the floating of the flights on top of the material impossible; and by guide axles with flanged wheels, which fix the position of the pipe laterally. The flight frames, Fig. 2, are attached to the pipe by U

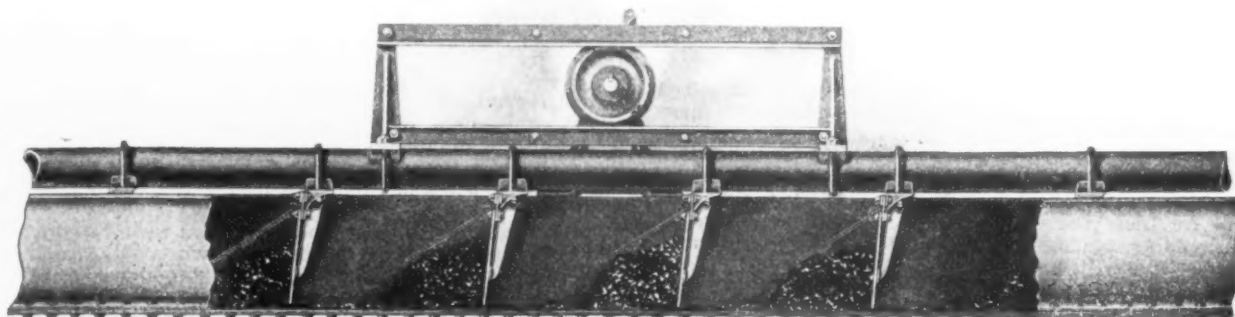


Fig. 2.— Flight Frames.

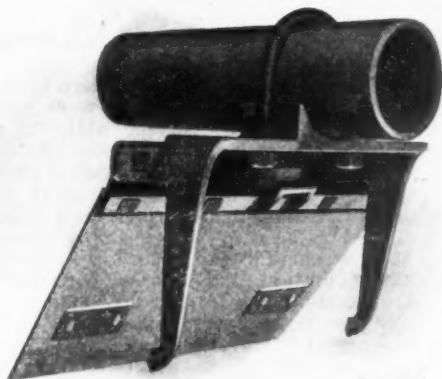


Fig. 1.— The Flight

clamps. The flight is connected to the flight frame by a flexible hinge. On the back of the bar which secures the hinge to the flight will be noticed a rectangular eye which engages during the forward travel of the flight on a rectangular boss. The combination of the two forms the hinge protector, a simple and effective device which assumes, in connection with the frame prongs, all strains in pushing the material forward. No tearing or buck-

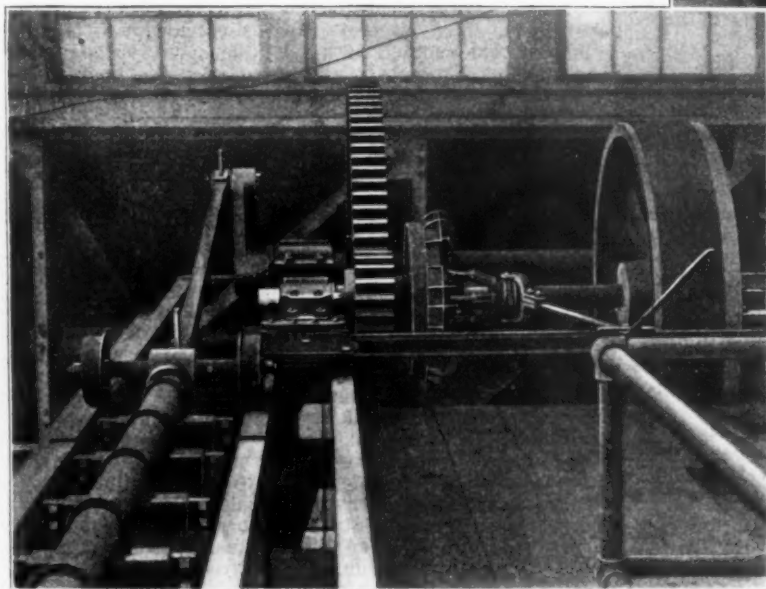


Fig. 3.— Driving Mechanism.

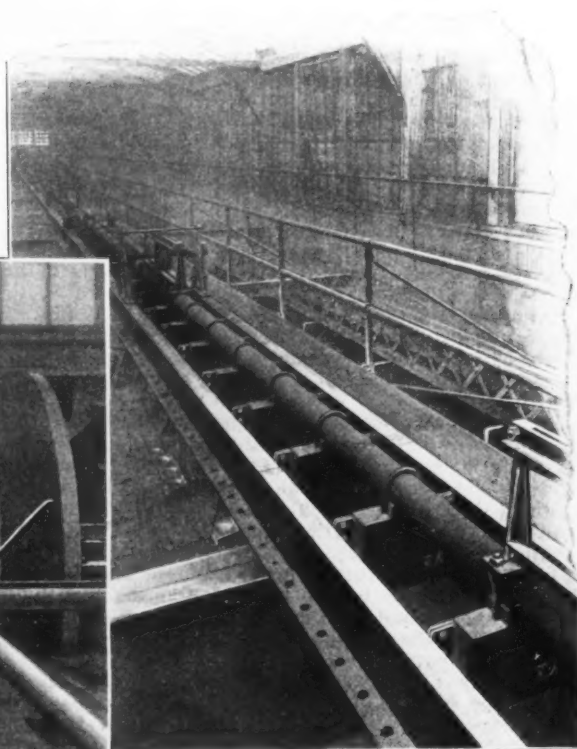


Fig. 4.— Reciprocating Conveyor in a Foundry.

### THE HEYL & PATTERSON RECIPROCATING CONVEYORS.

gates in the bottom of the trough in which the flight works permit the discharge of the material, in whole or in part, at any desired point.

An examination of the engravings will convey an idea of the principle of construction. The flights, Fig. 1, are suspended from a continuous member, usually in the shape of a pipe, which insures the greatest stiffness with

ling strains come on the hinge, which is usually made of harness leather and has a life fully as long as the blade, which in time, through contact with the abrasive material, is worn away. The position of the flight being fixed, and as there is a clearance of at least 1 inch between the flight and trough, the latter may be made of wood and requires no lining, as the material is pushed

along a surface composed of its own particles. The driving mechanism, Fig. 3, which imparts the reciprocating motion to the pipe, has no complicated features about it. The cross head on the guide wheels is connected to the pipe, and the balance of the mechanism, such as pitman, crank pin, gearing, fly wheel, friction clutch, &c., is of simple construction. The general construction is such that, with a few repair parts on hand, renewals can be made quickly by unskilled labor.

### The Problem of Machine Molding.\*

BY E. H. MUMFORD, ELIZABETH, N. J.

The much discussed question, how molding machines shall be used in our foundries and the reasons why there should be any discussion of the question whatever, are made the subject of what is written below.

It may be well to look at the real hard facts in the situation as the machine finds it to-day; try to find reasons for these facts and then to discuss the future of the molding machine from the basis of the present and the deductions it is possible to draw.

There are five prominent facts:

1. Molding machines have entered upon a field of work in which they have proved their usefulness and economy, and in which they are destined to remain instruments of progress.

2. Machines dispense with some of the skill necessary to the molder by the method of their working and render more of this skill unnecessary by avoiding some of the difficulties hand molding introduces, such as mending broken corners, &c. They may, therefore, be successfully worked by unskilled laborers.

3. While laborers are perfectly well able to make machines profitable, in doing this they generally earn almost molders' wages, when paid by the piece or when putting up a large day's work, and it is therefore possible for a molder to do as well for the owner of the machine and for himself as the laborer does if he will work as hard.

4. The molder will not do as large a day's work as the laborer on a molding machine for the same amount of money, and is therefore an expense to the owner of the machine he runs, similar to what would result if molders were to charge the cupola or run the cranes.

5. There is work enough for both machine and molder, and the machine, taking, as it does, the repetition work, relieves him of the monotony which the general introduction of machines is accused of forcing on the wage earning class as a whole, and owing to the speed and cheapness with which the machine turns out small parts, more of the larger and more intricate portions of machines are called for from the molder.

Another fact that is proven by statistics is that the general introduction of labor saving machinery in the world of manufacture, while it has undoubtedly the (at least temporary) effect of displacing labor in the special field which it enters, yet increases rapidly the number employed in two other fields—namely: that where the machines are built and that which uses no machinery at all. That is, anything which facilitates the use of labor saving machinery in general, as in the textile and agricultural industries—which the molding machine obviously does—increases the number of men employed in making these machines. As the molder, most naturally, is interested in the future of his trade, he should, therefore, do everything he can to encourage machine building in general, and nothing offers a better opportunity than leaving the molding machine absolutely untrammelled in its natural progress with unskilled labor.

To say that molding machines have found and entered upon their field of usefulness rather under than over states the fact. They have partly created the field. This will be understood to be particularly true when it is considered that everything may be treated as a molding machine which substitutes a mechanical guide or movement completely for an action of a molder, thus taking over for the special case, perhaps, this action to itself. A simple illustration of a molding machine of this sort, if it had enough parts to be called a machine, would be the time honored match or follow board. This simple machine element usurps completely the very tedious and delicate operation of jointing the surface of the drag around the pattern. There is absolutely nothing of this operation left for the molder when the match board is lifted off, if it has been properly fitted to the pattern, and add to the board a hinge and clamp, so that it rolls over with the drag, or provide it with mechanism for its removal, as a crane, and in the combination you have a molding machine which simply joints the mold.

It is safe to say that, if every pattern had had to be jointed in a mold by hand for all the years since match

boards first came into use, relatively very few duplicate castings or machines embodying them would be in use to-day. The match board, the sand match, the hand rammed stripping plate, the power rammed stripping plate with automatic draft, the vibrator machine with patterns and match in one piece, the vibrator frame using patterns without expense for fitting to the molding machine, and thus rendering the most irregular patterns instantly applicable to molding machines, are all steps of progress in the creation and development of the machine molding field.

In other words, the molding machine is not a new thing introducing new problems and conditions to the trade. By the perfectly natural and irresistible evolution of its destiny it has finally reached a point of independence where it does not need the expense of the skilled craftsman.

Simultaneously with it has come the greatly extended use of duplicate castings, the demand for which the molding machine has helped to create, so that it comes not as a beggar, but as a useful and well-known member of society.

The officers of the Iron Molders' Union have recently taken the stand that, to quote their own words, members of the union should be allowed "to develop the best possibilities" of the molding machine, thus also to "control" the machine. Undoubtedly these men are perfectly sincere in their belief that these things can be done, and some attempts to prove this have been made. Now the "best possibilities of the machine" are, of course, those in the path of economy in its use, and the demonstrations of the molder's power in this direction have not been such as should encourage him to persevere.

Some machines of the most efficient modern type were undertaken by union molders in a line of work where it was, by chance, perfectly easy for the writer to make exact comparison with exactly similar machines on exactly the same work in another shop. Result: 65 flasks from the molder for \$2.75, and 160 flasks from the laborer for \$2.40—i. e., what was costing more than 4 cents in one shop was costing only 1½ cents in the competing shop—and I have wondered ever since if the union seriously meant this as an initial step toward the "control" of the molding machine, as it certainly could not be considered its "best possibilities." No, the control of the molding machine will never pass from the hands of the evolutionary destiny of the manufacturing world to either the molder, the builder of the molding machine or its owner. And the figures quoted above show that machines may be made to pay without molders.

Why the molder will not work harder, so as to make the molding machine as successful in his hands as in the laborer's, is not a hard question to answer. Very little use for his hard learned trade is called for. If the molder would succeed as a machine operator, he must forswear his handicraft and strengthen his back, and there is, as he wisely reflects, no real reason why he should—therefore he doesn't. Why should he?

But why does the Molders' Union seek to control the machine? It has been implied by one of its officers that it is because it is becoming a power which threatens the power of the organization. This is true of some shops absolutely, of some partially, and in some, as the machine is known to-day, it never will be true, and nothing except the development of the machine and its accessories can change the situation.

In the first instance, the entire work of the foundry is or will be molded by machines; in the second, the machines mold or will mold a portion of the work, and in the third, the work is of such a sort that no existing machine can profitably handle it. In the first named foundry, no molders will be found of the kind we are discussing. In the second, molders will be found making such pieces as the machines would not pay on, and making more of those very pieces because the machines have cheapened the smaller castings, making it easier to get what probably represents the more troublesome and expensive parts of some line of manufacture, and to get them so promptly that more of the large pieces are sure to be needed on account of improved deliveries of the finished outfit. There is thus, apparently, every reason why the molding machine, with its unskilled labor, and the molder should form a very happy working family in such a shop, and why they do not is hard to see, except there is being forced there some ulterior object foreign to the interests of the molders in that shop and foreign to the interests of the shop owner.

The only possible reason why, in a shop employing both molders and molding machines operated by unskilled labor, the Molders' Union should object to such operation of the machines seems to be this: In case of a difference of opinion between the union and the owners of the foundry as to how (the owner would say) the shop should be run or (the Molders' Union would say) the men should be treated, which involved a strike, the foundry would not be absolutely closed, inasmuch as

\* Read before the American Foundrymen's Association.



the machines would not be stopped, and heats would be taken off every day.

If this is the reason why the Molders' Union is seeking to "control" the molding machine, then what has been written above has no interest for the molder, there need be no pretense of an attempt to "develop the best possibilities of the machine" nor argument of the present nor thought of the future. Everything is plain and above board, as soon as this is admitted, and "control" of the traveling crane, or the water supply, or the high-way leading to the foundry, would do as well.

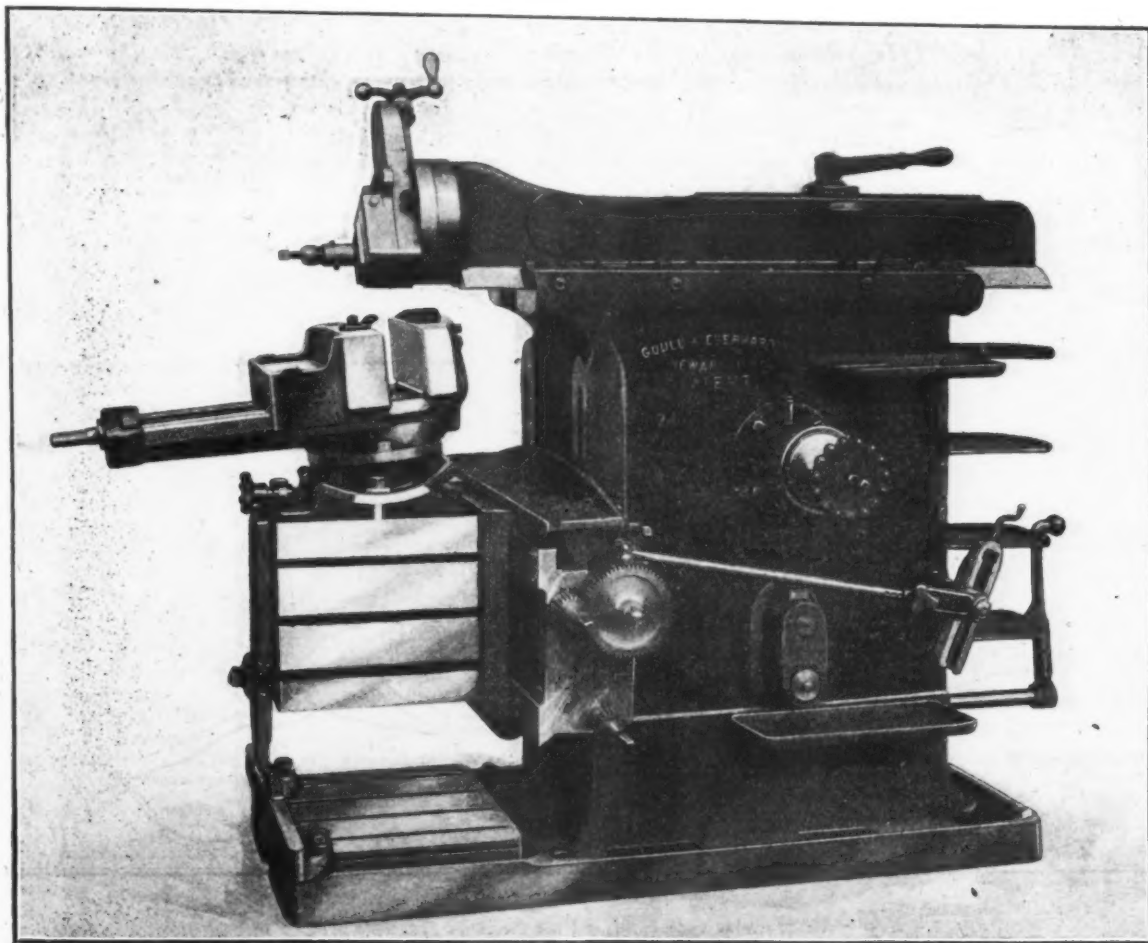
I will not think that any one interested in the future of the iron or brass molders' trade will do anything to impede the progress of the molding machine. I do not think, even, that any employer will be deterred from introducing improved machinery such as molding machines in his foundry by any consideration except the economy he may realize from its use with unskilled labor, and I know that the introduction of the molding machine in our foundries is as certain to be successful

### The Eberhardt Shaper Vise.

In order to satisfy a demand which originated with the makers of steel molds used in connection with glass molding, Gould & Eberhardt of Newark, N. J., have recently placed on the market a special tilting vise. The accompanying illustration shows the vise in position on one of their extension base shapers.

The design of the base of the vise is such that any angle of cut may be obtained. Consequently its use is not limited to the working of glass makers' molds, but is adaptable to many other uses. It has been found useful in various operations of die making and numerous uses have been found for it in the factory tool room.

As will be seen from the engraving, the apparatus consists chiefly of an additional base, which is bolted to the angle or table of the shaper, and to which the ordinary form of vise is fastened. Convex and concave bearings furnish the means of tilting the vise forward or



THE EBERHARDT SHAPER VISE.

as that of the turret lathes (to which the molding machine has often been likened) and the other automatic machines all through the machine shop.

I would close by saying that, as a bullder of molding machines, I know the situation to be as I have pictured it above, and what I have written is not mere theory of a machine molding millennium, but the sober judgment of experience.

Let me further say that, in mingling with molders who have worked for me and dealing with their union committees, I have found them, individually, men of such good sense and spirit that I have built upon these qualities among the molders the expectation that the present rather absurd obstruction of the molding machine operated by men not molders, but men for all that, will speedily die out.

Jos. E. Bissell has resigned his position as president of the Monongahela Machine Tool Company of Pittsburgh to represent the Prentiss Tool & Supply Company of New York in Pittsburgh and vicinity. The business of Mr. Bissell, as heretofore, embraces both new and second-hand machinery, but on a more extensive scale than formerly. His headquarters are in room 100, German National Bank Building, Pittsburgh.

backward as is desired. These are securely held in place by two stud bolts and suitable washers. The adjustment to any angle is obtained by a worm segment and worm controlled by the small hand wheel shown directly underneath the ways of the vise. A circular T slot and suitable bolts allow for the swivelling of the vise to any angle. Graduations are furnished to enable obtaining accuracy. By swiveling the shaper head at end of ram, as shown in the engraving, another angle is obtainable.

The vise shown is a special one and embodies several interesting features. It is provided with means for holding the loose jaw as well as the work down solid to the body of the vise. Provision is made for striking the vise in order to bring it in line. This consists of an extra amount of metal being placed at the end of the ways. The object of this feature is to prevent the workman's striking the sliding surfaces with a hammer and thus ruining the vise in time.

The tilting apparatus was invented by William F. Koeppen of Marion, Ind.

The great electrical firm, the Siemens-Halske Company of Berlin, London, Vienna, and St. Petersburg, took 51 prizes at the Paris Exposition, including 12 grand prizes.

## Glimpses of the British Iron Industry.

### II.

EDITORIAL CORRESPONDENCE.

#### The Cleveland District.

It is to the famous Cleveland district of which Middlesbrough is the center that he naturally at first turns who desires to study Great Britain's iron resources and producing methods. The last of the great producing districts to be developed, the Cleveland region is the

many following with a model plant. Now we have the famous old firm of Bell Brothers attacking the interesting problem of utilizing the domestic ores for the manufacture of basic open hearth steel. Robbed of its pre-eminence in supplying rails, the district promptly swung into the work of supplying the material for shipbuilding and handles an enormous tonnage in this branch.

A few figures may suffice to indicate this position of the Cleveland district as a contributor to the output of Great Britain. We take the figures for 1898, the latest official figures from the Inspector of Mines available:

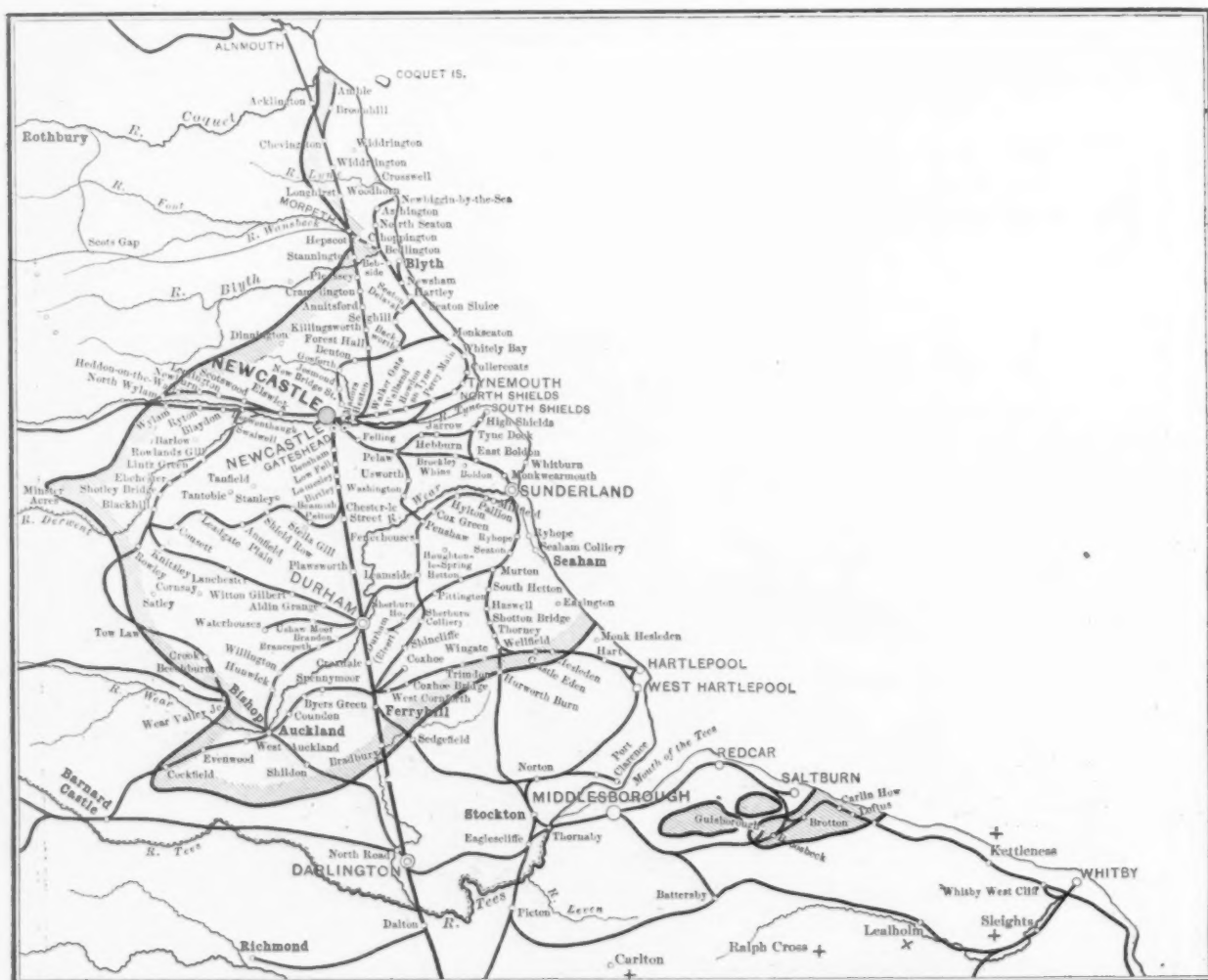


Fig. 1.—Map of the Durham Coal Field and the Cleveland Ironstone Mining District.

greatest of all, so far as tonnage is concerned, and, taken all in all, owing to natural conditions, probably that possessing the greatest vitality. For many decades Middlesbrough was the Mecca of iron makers and metallurgists from all over the world who were anxious to study advanced practice. The district has maintained a heavy output in the face of trying vicissitudes, its producers adjusting themselves promptly and successfully to changing conditions. A period of extraordinary prosperity and development was created by the enormous expansion of the demand for railroad building, the Cleveland district being one of the greatest sources of supply for the iron rail. With the advent of the steel rail the Cleveland trade collapsed completely in a few years. The cheap home ores were not suitable for Bessemer manufacture, so that the steel works which were built relied upon imported ores exclusively. Then Middlesbrough began to reach out for the foundry trade and for such outlets for forge iron as were still available, and practically conquered her principal rival, the Scotch district, underselling the furnaces at their own doors. Middlesbrough, through its largest producers, Bolckow, Vaughan & Co., Limited, was the first to seize the promise of the basic Bessemer, the Northeastern Steel Com-

#### Pig Iron Production of the Cleveland District in 1898—Gross Tons.

County.	Hematite.	Basic.	Ordinary and Spiegel Ferro.	Total.
Durham .....	586,727	516,768	.....	1,103,495
North Riding, Yorkshire .....	602,184	1,455,386	67,561	2,095,131
Total Cleveland .....	1,188,911	1,942,154	67,561	3,198,626
Total England .....	2,755,975	4,209,190	203,916	7,169,081
Wales .....	321,592	56,499	.....	378,091
Scotland .....	519,646	542,931	.....	1,062,547
Total Great Britain, 1898 .....	3,597,213	4,808,590	203,916	8,609,719
Total Great Britain, 1897 .....	3,651,046	4,916,820	228,599	8,796,465

The Cleveland district in 1898 therefore produced 37 per cent. of Great Britain's production. Of course the hematite pig made was obtained from imported ores, which to some extent were needed also in producing the basic iron. The consumption of iron and of coal, converting coke into coal, was as follows:

#### Consumption of Materials, Cleveland District.

County.	No. Furnaces blast.	Pig product in gross tons.	Iron ore used in gross tons.	Coal used in gross tons.
Durham .....	41	30%	1,103,495	2,665,035
North Riding .....	81	64%	2,095,131	5,781,670
Total .....	122	95%	3,198,626	8,446,705
Great Britain .....	378	.....	8,609,719	20,958,167
				17,196,436



During 1898 the imports of foreign iron ore into Great Britain were 5,468,396 tons, of which the following quantities went into ports of the district:

	Tons.
Hartlepool .....	178,641
Middlesbrough .....	1,102,771
Newcastle .....	325,378
South Shields .....	351,886
Stockton .....	252,283
Sunderland .....	67,220
Total .....	2,278,179

In 1898 the production of iron ore by districts was as follows:

	Production. Gross tons.	Percentage.
Scotland .....	824,219	5.8
Cumberland and Lancashire .....	2,001,191	14.1
Cleveland .....	5,730,413	40.4
Staffordshire .....	1,111,712	7.9
Lincolnshire .....	1,848,404	13.0
Northamptonshire .....	1,406,150	9.9
Other counties .....	1,144,578	8.1
Ireland .....	113,271	0.8
Total .....	14,176,938	100.0

points marked with a cross by Sir Lowthian Bell the two seams are only about 4 feet in thickness each and poorer in quality as to iron contents. The thin seams, or one of them to the southward, was worked for some years before the thick bed was made known and led to the creation of the great iron district. Sir Lowthian Bell roughly calculates that the bed of ironstone, thick and thin, extends over 200 square miles. The area indicated in the map, however, embraces only that part which is now being actively exploited.

The Cleveland Ironstone.

The accompanying map, Fig. 2, for which we are indebted to David Evans, managing director of Bolckow, Vaughan & Co., Limited, shows more in detail the Cleveland mining district. Its northern outcrop is tapped by a number of short lines, some of which are private property, like that connecting the Eston mines of Bolckow, Vaughan & Co. with their furnace plants at Middles-

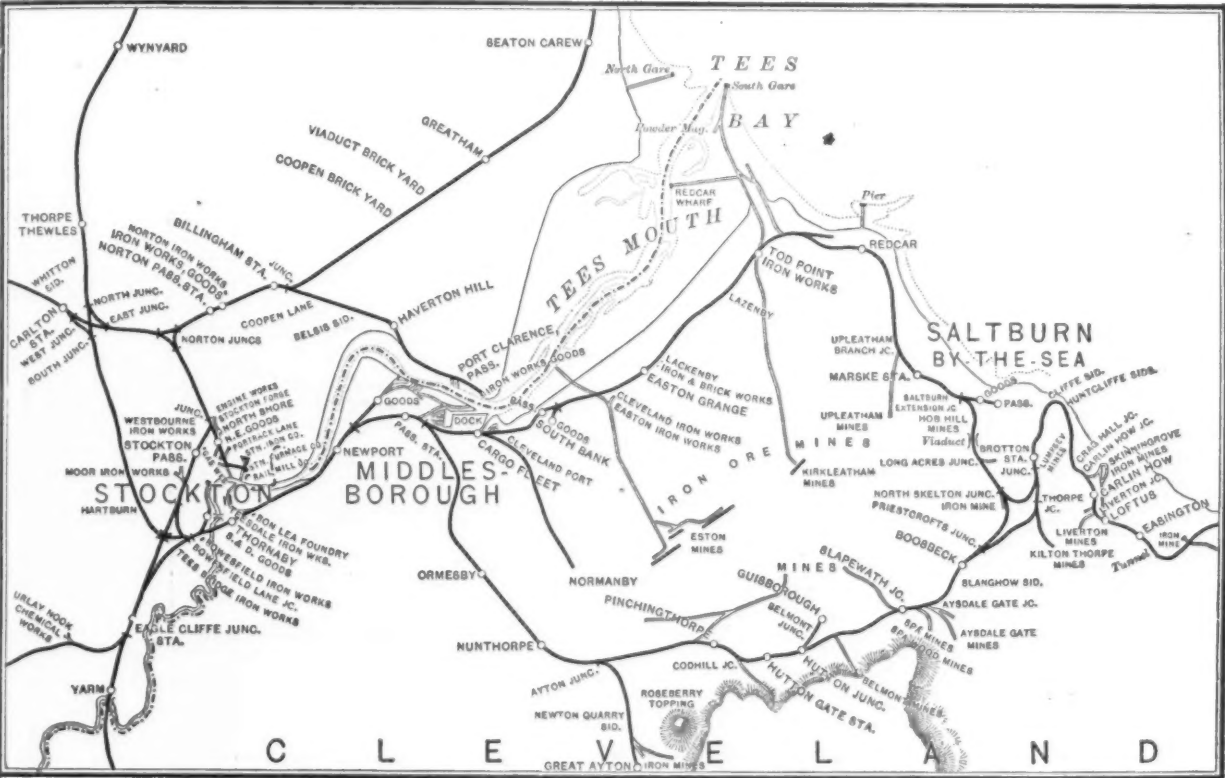


Fig. 2.—Map of the Cleveland Ironstone Mining District.

It will be observed that the Cleveland district contributed 40 per cent. of the total product, which, however, is apt to be misleading, since it ignores the quality of the ore. The Cumberland and Lancashire product is a high grade Bessemer yielding 54 and 51 per cent., while the Cleveland ores yield about 30 per cent.

The extraordinary status of the Cleveland iron industry depends upon the proximity of coal and iron ore to tidewater, thus rendering possible cheap assembling of materials and shipment of product. The accompanying map, Fig. 1, shows the position of the famous Durham coal field, north of Middlesbrough, and the Cleveland iron mining district, the former being inclosed in the hatched belt, while the latter is indicated by full hatching, with Brotton and Guisborough as larger villages. The map shows the great shipping ports on the Tyne and the Tees.

We are indebted to Sir Lowthian Bell for indicating the area of coal and ore districts. It is necessary to state in this connection that the Cleveland ore seam extends far beyond the limits of the area indicated, in a southerly direction, but a band of shale gradually widens out, splitting the seam into two parts. At the

brough and Eston Grange, while a branch of the North Eastern railroad taps those which reach the vein by shafts.

The vein has reached its greatest development at the Eston mines, a section being shown in Fig. 3. It will be observed that the thickness of the seam at this point is 15 feet 7 inches, the foot of inferior ironstone below not being worked. The sulphur comes away with the ironstone and is picked out and sent to the ballast tips. The dogger constitutes the roof. The great thickness of the seam, and the fact that the ore is delivered to the furnaces by a private line, with the grade in favor of the traffic, makes the cost at this group of mines exceptionally low. Bolckow, Vaughan & Co., Limited, who own the property, mine upward of 1,000,000 tons annually from it alone, producing about the same quantity from the North Skelton group.

As the vein dips under increasing cover to the south-east it falls off in thickness to about 10 feet, and deeper shafts must be sunk to reach it. The vein develops near its center a leaner body of ore, which ultimately degenerates into a bed of shale, splitting the vein into two. At the same time the grade of the ore declines and





at 42 shillings, making the district tonnage rate for hand mining 10.75 pence. This sliding scale expired some time ago and has not been renewed. Now the men are advanced or reduced from time to time by mutual agreement, according to the state of the pig iron market. The base rate for miners is still 9.50 pence for the ironstone miners proper. From April 1 to October 15 of the current year the tonnage rate has been raised, as the result of current prices for pig iron, to 14.625 pence per ton. The different other employees are correspondingly advanced, so that the wages cost is considerably over the normal at the present time.

It is stated that approximately the cost of the Cleveland ironstone, delivered at the furnace, when the miners are paid at the base price, without any advance on that rate, figures about 3½ shillings. It is interesting to note that the official Government statistics place the average price per ton of the ore mined in the Cleveland district at 3 shillings 4 pence, which, however, is probably at the mouth of the mine, at a time when the labor cost was considerably above the base. The cost of 3½ shillings given as above by one of the largest producers is delivered at the furnace, but it must be remembered that it is estimated at the base rate of wages, so that now it is a little higher.

In normal times, therefore, the Cleveland raw stone, delivered to the calcining kiln, costs about 3½ shillings for an ore which yields slightly less than 30 per cent. of iron. This is 2.92 cents, say 3 cents, per unit of iron. To this, of course, must be added the cost of calcining, which, however, is very small indeed, the fuel consumption being low. It takes from 75 to 80 pounds of slack coal per ton of raw stone. As an offset naturally is the advantage over other important districts in Europe that the calcined stone runs 40 to 42 per cent. of iron.

The Cleveland district, therefore, possesses the very great advantage of a very cheap iron ore, which, however, is rather siliceous, so that quite a considerable quantity of limestone must be charged. This amounts to about 11½ hundredweights per ton of iron produced, running on ordinary iron.

#### The Durham Coal Field.

One of the most important of Britain's coal fields is that of which Durham and Newcastle are the leading centers, and metallurgically it is the greatest, since it is the great source of supply of coke in England. The official statistics for the year 1899 show that in the Durham inspection district there were mined 24,405,784 tons of coal, the Newcastle inspection district following with 23,753,161 tons. Together, therefore, this field produced 48,158,945 tons out of a total for Great Britain of 220,085,368 tons. Unfortunately the mineral statistics of Great Britain do not include the production of coke, so that it is impossible to give numerical expression to the pre-eminence of the Durham district in this respect.

The stratification and position of the various seams in the district is well shown by the accompanying section, Fig. 4, of the Auckland Park pits of Bolckow Vaughan & Co., the depth to the Five Quarters seam being 22 fathoms 5 feet, to the Main Seam 38 fathoms 1 foot, to the Low Main Seam 65 fathoms 3 feet 4 inches, to the Hutton Seam 76 fathoms 5 feet 9 inches, to the Harvey Seam 106 fathoms and to the Brockwell Seam 150 fathoms. The thickness of the different seams at this point is: Five Quarters 5 feet, Main 1 fathom 1 foot, Low Main 3 feet 3 inches, Hutton 2 feet 3 inches, Harvey 3 feet 5 inches and Brockwell 5 feet.

The coal used for coking is mined from a number of the seams. Thus Bolckow, Vaughan & Co., Limited, coke the Five Quarters or Busty Seam at the West Auckland colliery. The Harvey and Brockwell seams at the Auckland Park colliery, the Five Quarters and the Main coal seams at the Leasingthorne colliery and the Harvey seam at the Binchester colliery.

The composition of the coke from the different collieries is as follows:

Composition of Durham Coke.

	Woodfield.	West Auckland.	Auckland Park.	Leasingthorne.	Binchester.
Carbon	89.12	86.85	88.90	87.03	88.87
Sulphur	1.12	1.15	1.10	1.09	1.11
Ash	8.66	10.00	9.00	10.00	9.00
Moisture	1.10	2.00	1.00	1.88	1.02
Totals	100.00	100.00	100.00	100.00	100.00

The miners are paid according to the selling price of the coal, which is ascertained every three months. For each advance of 2 pence per ton they are entitled to an advance of 1¼ per cent., and since August 13 they have been 55 per cent. above the basis of 1879. Thus in the case of the hewers the basis wage is 4 shillings 2 pence per shift, so that with the advance they are now averaging 6 shillings 11 pence per shift.

Although a number of the leading iron makers are rapidly introducing by-product coking ovens, by far the greatest part of the coke is still made in beehive ovens. The yield in them is rather low, reports from a number of plants varying from 55¼ to 59¼ per cent.

As indicating the position of well managed, well located plants, in normal times, the statement may be made that with wages at the base, the cost of the coal per ton of coke ranges from 5 shillings 8 pence to 6 shillings 2 pence. On the coking the wages are 1 shilling 7 pence and on stoves 2½ pence, thus making the cost of coke from 7 shillings 5½ pence to about 9 shillings.

C. K.

#### For Higher Commercial Education.

The New York University of New York City has made a notable new departure in the establishment of a school, to be known as the School of Commerce, Accounts and Finance, which will be opened on October 1. The school will form a new department of the University and will be equipped with a corps of professors and instructors of its own just as the law or medical schools of the university. This is said to be the first instance in this country in which a school of commerce has formed a regular department of a leading American college. The school is a result of the general movement for the provision of a higher commercial education for the young men of the country, and its establishment is due in large measure to the work of the New York State Society of Certified Public Accountants, who took the initiative in the matter. It differs from the several schools of finance or commerce recently established as special courses in connection with other American colleges in that its entire instruction is intended to be professional in character. It is not designed merely to fit young men to become wage earners as book keepers, clerks, &c., but is intended to equip them with the power to become leaders in the commercial and financial world, to grasp the details of great business enterprises and carry them to a successful issue. The idea of the school is a recognition of the fact that the commercial field of the United States has so broadened out and the conditions of modern business have become so vast and complex that highly trained and specially educated men are needed to deal with them. The school will thus offer valuable advantages to the young man who is ambitious to become an administrator of great financial enterprises, a bank president or the holder of an office of public trust. The classes will meet in the evening, to permit the attendance of young men employed in business during the day, and the students will be instructed in the history and development of accountancy, as connected with trade and commerce, finance and municipal and State government, in the science of accountancy and the reduction of its principles to practice, in commercial law, and in the general principles of economics and their application to various lines of business. The faculty of the new school is a strong one, composed of practical men, prominent in the professions of law and accountancy, with Charles Waldo Haskins, president of the New York State Society of Certified Accountants, as dean.

**The Tin House Scale.**—A conference has been arranged between the Wage Committee of the Tin Workers' Protective Association and the American Tin Plate Company, to be held in the Astor House, New York, on Thursday, September 13. It is probable that a scale for tin house labor will be arranged at this meeting, and the idle tin mills of the American Tin Plate Company started up.

The American Car & Foundry Company have signed the amalgamated scale for their rolling mill at Detroit, Mich.

# The Iron Age

New York, Thursday, September 13, 1900.

DAVID WILLIAMS COMPANY,	-	-	-	-	-	PUBLISHERS.
CHARLES KIRCHHOFF,	-	-	-	-	-	EDITOR.
GEO. W. COPE,	-	-	-	-	-	ASSOCIATE EDITOR, CHICAGO
RICHARD R. WILLIAMS,	-	-	-	-	-	HARDWARE EDITOR.
JOHN S. KING,	-	-	-	-	-	BUSINESS MANAGER.

## Redemption of Bank Notes.

The amount of bank notes redeemed in the past few months is considerably larger than the amount in the same months of several previous years, and the question has been raised whether this indicates a redundancy of paper currency. It is also noted that the amount redeemed in the summer of 1896 was relatively large, and that since that time the bank currency has increased something like 50 per cent., while the increase in the amount of redemptions is very much less than that.

When there is an excess of currency, or when it is difficult for banks to keep all their circulation out, they have an obvious motive for returning the notes of other banks to the redemption agency and issuing their own notes. When the volume of redemptions increases it may be inferred that the demand for money has grown slack. But it is admitted that the redemption process of the national banking system is cumbrous and operates with no such promptness and automatic accuracy as the "Suffolk Bank" system of Boston nearly 50 years ago, and the condition of business, and consequently the demand for money, is very different now from what it was four years ago.

An officer of a bank in this city said recently that his bank had \$3,000,000 which it was trying to lend but for which it could find no borrowers. Transactions on the Stock Exchange are small and general trade is lighter than it was a year ago. The volume of clearings, however, is much greater than it was in same period in 1896, when, perhaps on account of the Presidential campaign, it was less than in 1895. The bank clearings for June, July and August for these four years have been as follows:

1900.....	\$18,611,442.984
1899.....	21,577,934.996
1896.....	12,208,410.948
1895.....	13,121,470.855

But within the last few months there has been, under the law of March 14, a large addition to the bank currency. It is entirely natural, therefore, that the redemptions should be much larger than last year; with prompter redemption at centers in various parts of the country the redemptions would probably have been greater than they have been. It is not improbable, considering the season of the year, the uncertainties abroad and the common influence of general elections on business, that the currency is in excess for the time being, and, if so, the increased redemptions show how the remedy is, to a certain extent, automatically applied. The volume of Government paper is fixed; it can only be changed by law; the volume of bank paper adapts itself, within certain limits, to the varying need of money.

It is eminently desirable that there should be no stringency to depress prices, and no redundancy to foster speculation and artificially and temporarily raise prices. It is to be desired that the banks should be able easily and profitably to respond to demands for more money and should have their notes promptly returned to them when the demand declines and the currency is in excess.

If the currency is displaying some degree of real elasticity, a quality it can hardly be said to have possessed, there is a distinct gain for the business community. No system has been devised that will afford a high degree of elasticity in a currency secured by the deposit of bonds, and public sentiment, and even a good deal of banking sentiment, is not yet ready for a currency based on the general assets of the banks. But if some degree of elasticity has been imparted to the bank currency the country may be glad of the fact both for its own sake and because a better understanding of the advantages of an elastic currency will promote a demand for a banking system under which the volume of notes would respond as quickly and as freely to the varying demands of business as the volume of bank notes in Canada, for example, does.

## A Boom and What Follows.

The period, usually 8 to 12 months, following a "boom" in general business, is always one of great difficulty and embarrassment to those legitimately engaged in any form of productive or distributive industry. A "boom" bears about the same relation to ordinary business that a banquet of many courses and unlimited wine, liquors, black coffee and strong cigars, bears to the average daily dinner of a well ordered private family. Even for those whose only connection with the banquet was to enjoy its pleasures to the utmost—to eat, drink and be merry—there is usually a longer or shorter period of headache, impaired digestion and a sense of fatigue of mind and body. Not many can come to the breakfast table the morning after a banquet with healthy appetites, or read their morning mail with a normal interest in the practical affairs of life. Even the memories of the feast are disappointing when compared with its anticipations. We wonder that the over-seasoned and highly artificial viands seemed so dainty and palatable; that the wine was capable of tempting to overindulgence, and that we did not stick to honest claret and let the factitious sauternes, sherry, champagne and cordial go by; that the conversation had seemed so brilliant, the speeches so witty and eloquent. A judicious employment of a corrective for biliousness ultimately changes all this, and in 48 hours the average man begins to look forward to the next occasion which will give opportunity to repeat the folly and pay the penalty.

It is thus the manufacturer, the mine owner, the railroad manager and the merchant recover from a "boom" in general business. They may or may not have had their share of the prosperity which seemed so abundant, but from which so few, comparatively, reap an advantage at once substantial and permanent. The chances are that the more legitimate and honest one's connection with material affairs, the less he gains for himself and the more he contributes to the gains of others. The net profits of a boom are seldom large enough to compensate for the disturbance of established business conditions and the general unsettlement of normal trade relations. To an astonishingly large extent they represent the marking up of prices on relatively small stocks, showing apparent gains largely offset by the subsequent shrinkage on relatively large stocks, which have to be marked down when the reaction sets in. If all price variations could be made absolutely, or even approximately synchronous, so to speak, no great disturbance would result, but this is impossible. Prices rise rapidly under the impulse of speculative buying. The cost of production advances less rapidly,



but more certainly. If prices fall or fluctuate, as they are liable to do from very slight causes, even during the continuance of a boom, there is no sympathetic readjustment all along the line. Indeed, a belated advance in raw material is quite likely to be coincident with a premature fall in the prices of finished products. As the rule, the high water mark in the cost of production is not reached until the boom is over, business is shrinking and prices are declining. Raw material is often the last to feel the general betterment of trade conditions and, possibly helped by speculation, claims its share and perhaps more. Railroad tariffs are readjusted to the new conditions, and increased earnings are often coincident with a decrease in the tonnage movement. Labor, gaining new confidence from the well maintained fiction of abounding prosperity, takes the benefit offered it and usually perfects its plans to demand a great deal more, while the employer is passing sleepless nights considering how he can cut down his costs to meet the conditions of a rapidly declining market.

About this time an element of confusion is introduced into all departments of trade, by postponements of deliveries on goods ordered and the cancellation of contracts all along the line. On a falling market it is proverbially difficult to make deliveries which conform to specifications, or are in any respect up to the accepted standard of "good merchantable quality." It is surprising how many excellent reasons can be found for refusing to accept deliveries which, 30 or 60 days before, were wanted so exigently that every shipment had to be followed by a tracer. Thus are begun lawsuits which congest the court calendars for years, entail large expense to plaintiffs and defendants, generate much ill feeling and rarely terminate to the satisfaction of either party in interest.

The last phase of the reaction from "boom" conditions is invariably a serious unsettlement of the labor market. The scaling down of wages is usually delayed as long as possible, but it must come at last, and when it does come the dying "boom" receives its *coup de grace*. Strikes or threats of strikes all along the line discourage enterprise, postpone undertakings and lead to a sharp restriction of orders for future deliveries. The capital needed to carry out the plans upon which manufacturers have depended to keep their mills running grows suddenly timid, shunning any form of investment likely to be interfered with by labor troubles. We do not, of course, expect organized labor to show good judgment under such circumstances. Its instinct is to resist the surrender of any advantage gained, however temporary the conditions which brought it; hence a reaction from general prosperity has come to mean a longer or shorter period of sharp conflict between employers and wage earners.

In all of these reasons together we find an explanation of the almost incomprehensible phenomenon of a sudden falling off in consumption which, within a few weeks or sometimes a few days, can produce an abrupt transition from extreme industrial activity to extreme industrial depression. Artificial conditions change more easily than natural conditions, and every phase of a business "boom" is to a great extent artificial. Fortunately they do not recur at brief intervals. They are subversive of everything tributary to the upbuilding of a sound prosperity, and to the maintenance of high standards of business morals; but they are the outgrowth of causes which can neither be foreseen nor guarded against, and all that they teach us is forgotten by the time the next "boom" is due. It has been so since the beginning of civilization, and it is likely to be so till the end.

## PERSONAL.

E. A. Schumacher, senior member of the firm of Schumacher & Boye, machine tool builders, Cincinnati, Ohio, has just started on a trip around the world, in which business will be combined with pleasure, the trip consuming the greater portion of a year.

E. A. Noble, secretary and treasurer of the Webster Chain Company of West Superior, Wis., has resigned. Mr. Noble will go into business at St. Cloud, Minn.

Among those who have been proposed for membership of the Iron and Steel Institute are Charles H. Davis of New York, Ambrose Monell of the Carnegie Steel Company, Pittsburgh; Benjamin Talbot of Pencoyd, Pa., and William R. Webster of Philadelphia.

G. A. Trube of the Westinghouse Air Brake Company sailed for Europe last Tuesday. He will take up a residence in London, as he is now engaged by the Westinghouse Brake Company, Limited, of that city.

William C. Cuntz of the Boston sales office of the Pennsylvania Steel Company leaves for London on October 1 to take a position in the London office of the same company.

The will of James Hemphill of Mackintosh, Hemphill & Co. of Pittsburgh, who died recently, was filed for probate in that city last week. Mr. Hemphill left an estate valued at \$1,030,000.

A. M. Byers of A. M. Byers & Co., Pittsburgh, manufacturers of pipes and tubes, is lying critically ill at his summer home, Watch Hill, R. I.

Chas. L. Taylor, who was assistant to C. M. Schwab, president of the Carnegie Company, at the time of the reorganization of the Carnegie Steel Company, Limited, has tendered his resignation. The resignation is said to be due to Mr. Taylor's failing health. Prior to the reorganization of this company Mr. Taylor was in the sales department, and was with Alex. R. Peacock of the Carnegie Steel Company during his visit to the Pacific Coast last winter, and made the record breaking trip across the country with him in a special train. Until the return of C. M. Schwab from Europe, it is not expected that a successor to Mr. Taylor will be named.

Alexander R. Peacock, first vice-president of the Carnegie Steel Company, denies that there has been any trouble over the contract made between the Carnegie Steel Company and the American Bridge Company for structural material to be supplied to the latter concern.

## OBITUARY.

FRANCIS E. HINCKLEY.

Francis Edward Hinckley, who was prominently identified with a number of important railroad and commercial enterprises, died from heart disease at his home at West New Brighton, Staten Island, N. Y., on September 6, aged 66 years. He was born at Elmira, N. Y., and went to Chicago in 1870, where he was engaged as an engineer in bridge and railroad building for 20 years. During later years he became connected with the Niagara Power & Development Company, and was one of the founders of a large steel company just formed in Canada. Five years ago his business interests necessitated his removal from Chicago to the East, and he settled in Staten Island.

THOMAS KINGSFORD.

Thomas Kingsford, head of the Kingsford Boiler Works, and a leading manufacturer of Oswego, N. Y., died in that city on September 7, aged 73 years. He was born in England, but came to this country at an early age.

**Launch of Monitor "Wyoming."**—The new United States monitor "Wyoming" was successfully launched on Saturday from the shipyard of the Union Iron Works at San Francisco, Cal. The "Wyoming" is one of four similar vessels now building for the navy, her contract price being \$874,000. Her dimensions are: Length on load water line, 225 feet; extreme breadth, 50 feet; mean draft, 12 feet 5 inches; displacement, about 2700 tons. The hull is protected by a side armor belt ranging from 11 to 15 inches in thickness. The turret is one of the balanced type, its armor being 9 inches thick. A conning tower with 7½-inch armor and a single military mast will also appear above deck. The vessel is to make 12 knots an hour. Her main battery will consist of two 12-inch breech loading rifles and four 4-inch rapid fire rifles. In the secondary battery will be three 6-pounder rapid fire guns and four 1-pounder automatic rifles.



### Lake Iron Ore Matters.

DULUTH, MINN., September 3, 1900.—There is much railroad building in contemplation for the Mesaba range. The Eastern Minnesota interests have explorers and prospectors in the field east of the present eastern terminus of their road at Virginia, and are not unlikely to make a start for the Vermillion range in the reasonably near future. They are energetic and vigorous, and have a policy that means the gathering in of everything in sight. J. J. Hill's acumen when traffic is in the air is noted, and he is ably seconded. Then the Duluth & Iron range are planning to extend their line westward along the Mesaba range. It now ends at Virginia, but the Minnesota Iron Company have extensive mineral interests some 10 miles west of there, and the Chandler Iron Company have a valuable property they are now taking from the option holders still further west. Other lands in township 58-20 that are supposed to contain ore are in the hands of the Federal Steel interests, and will be reached by this road. The Duluth, Missabe & Northern road have recently made traffic contracts that will oblige them to extend their lines to the eastern end of the range and in some other directions. The 50-mile cut off of the Eastern Minnesota will be ready for the steel in a few weeks, and will be used next spring for all ore coming off that road from points east of Hibbing. Their traffic for the coming season will be very large.

In other parts of the lake region there is no building under way, except the line of the Chicago, Milwaukee & St. Paul road into the Crystal Falls district and parts of the Marquette range, and the work of the Clergue Syndicate on the north side of Lake Superior.

Since the publication in *The Iron Age* a month ago of the work of this Clergue Syndicate in the Michipicoton district there has been a veritable pilgrimage of iron ore men and consuming interests to the region, looking at the Michipicoton fields and searching for new mines in that and other Canadian fields along the lake. The general supposition is that, so far as other fields are concerned, there are many serious objections, in character and quality of ores, &c., to the western Ontario regions. The Oliver Iron Mining Company (Carnegie) who have looked the field over for some months, are said to be dissatisfied with the outlook along the north shore. The Michipicoton district, while not possessing these disadvantages, is supposed to be so well in hand by the Clergue party that little opportunity remains there for others.

On the Mesaba range an important work has just been undertaken at the new Stevenson mine of Corrigan, McKinney & Co., in the commencement of stripping operations. A contract involving the removal of 1,000,000 cubic yards has been let to Drake, Straton & Co., and two steam shovels started this week. It is expected that about half the contract will be completed by the beginning of 1902. The surface over ore at this mine is from 15 to 40 or more feet at the part of the property to be stripped. At other points it is much deeper, and three shafts will be equipped. This mine can and probably will be a very large producer. It was leased to the operating firm at a low royalty, 12½ cents a ton for a maximum output, on the condition that its tonnage from the Commodore mine at Virginia be turned over from the Rockefeller road to that of the Eastern Minnesota. The fee ownership of the Stevenson is in the hands of J. J. Hill and associates.

The new Union mine, belonging to the American Steel Hoop and the Republic Iron & Steel companies, has completed its four-compartment shaft, sinking it 246 feet in an incredibly short time. The shaft is much the deepest of any about Virginia. A wooden shaft house 75 feet high has been completed, and the power of operating the shaft will be furnished from the Republic Company's Franklin mine, adjoining. A large stock-pile ground is being cleared off, and the indications are for much mining the coming winter. The Union's ore is generally regarded as about as fine, both chemically and physically, as anything ever found on the Mesaba range, and the owners consider that they have a very fine property. The Franklin mine's three large stock-piles are being shipped, and will be well cleared up by winter.

Geo. W. Wallace, superintendent of the Fayal mine, of the Minnesota Iron Company's group, has resigned, and leaves the mine at once. He has a remarkable record. Superintendent Wallace has been with the Minnesota Company since 1881, and in December, 1894, broke ground for the Fayal No. 1 shaft, in what was a perfect wilderness. To the close of this year the mine will have shipped almost 4,000,000 tons. Last season its record was 1,076,000 tons, and this year it will do much more. Up to 1899 the mine had been worked through three shafts, but early in the spring of last year Mr. Wallace began stripping for an open pit east of No. 3, and before the close of the year he had taken out of that pit more than 500,000 tons of ore, though the surface was from 20 to 40 feet. During these years the develop-

ment of this mine has not suffered by its immense production, and to-day it is developed ahead for an annual production of 1,000,000 tons for the next 40 or 50 years. Its entire reserves have not been opened yet, and only a few days ago a large body of ore was struck in the northeast part of section 8, near the main mine and under lease to the company. A great many new methods have been introduced at the Fayal, and it is probably the most interesting iron mine, all things considered, in operation to-day. Superintendent Wallace will retire from business and locate at Duluth.

There has been quite a stir about Duluth the past few weeks over reported finds of ore in township 57-9, in Lake County. An examination shows nothing but float of the ore bearing formation, doubtless brought down at some time from the Vermillion range. But several thousand dollars have been spent in getting title to lands there and in commencing explorations, which are still under way.

The American Mining Company (Steel & Wire) have stopped all their explorations near Negaunee, Marquette range, and will do little anywhere for some time. There is, however, some buying of mines of proved value on the old ranges by mining concerns that have not lost their courage and changed their policy by reason of the depression of the past few months. These mines are being picked up at a much lower price than would have been possible a few months ago.

The Oliver Company (Carnegie) are examining a property at Michigamme with the view of purchase. Shaft A of the Lake Superior Iron Company, at Ishpeming, has been finally and definitely abandoned, and is being permitted to drown. Negaunee mine is working nicely now, and improves steadily in appearance. Shipments have ceased from the Volunteer under the Cleveland-Cliffs option. About 20,000 tons have gone forward.

It is estimated that about 1000 men have been dropped from the payrolls of the various mines of the Michigan ranges in the past few weeks, most of them from the new Menominee range properties, some from the Oliver mines of the Gogebic, and some from the various properties along the Cascade range. As many men have been added to lake copper properties during the same period.

A new shaft is being sunk at the Lamont, Menominee range, to take the place of that ruined by caving. The new shaft will be put down in the foot wall in the old Paint River mine. When completed two old shafts will be abandoned and the pillars supporting them taken out. The Lamont is looking well underground. At the new find of the Federal Steel Company near Iron Mountain, mention of which has been made before, they are developing in a manner that is very encouraging, and the outlook is for a large mine.

D. E. W.

**Manufacturing Special Alloy Steels.**—The recent discovery of Goldschmidt that aluminum in powder form is one of the most powerful reducing agents known, has attracted widespread attention. It is possible by this means to reduce the most refractory oxides, and produce such metals as chromium, tungsten, molybdenum, manganese and nickel, perfectly free from carbon and in the fused state. This is possible because of the enormous heat produced by the chemical reaction of the aluminum upon the various oxides. The heat so produced is estimated at about 5000 degrees and can be equalled only in an electric furnace. We are advised that the Ajax Metal Company of Philadelphia have acquired a similar process for producing the alloys of the above metals with iron, and so low in carbon and silicon as to meet all the requirements of steel makers, but by the use of a far more cheaper reagent. It is stated that ordinary carbon steel castings can be made by this process in the crucible or on the open hearth. The castings so produced are so low in carbon as to almost approach malleable iron, and require no annealing. The Ajax Metal Company intend to manufacture these alloys in ingot form for the use of tool steel makers and manufacturers of armor plates, projectiles, &c., also to manufacture chrome, nickel and ordinary steel castings.

**The Thomas Iron Company.**—The annual meeting of the Thomas Iron Company at Easton, Pa., just held, was one of the best attended, about 40,000 out of the 50,000 shares of the company voting. During the past fiscal year the company produced more pig iron than ever in their history. Dividends aggregating 16 per cent. were paid on the capital of \$2,500,000, the earnings having been largely in excess of the amount distributed. The old board was unanimously elected. It consists of Samuel Thomas, W. H. Hulick, F. R. Drake, J. S. Krause, J. S. Rodenbough, W. T. Hardenbergh and B. F. Packenthal, Jr. The officers re-elected are B. F. Packenthal, Jr., president; W. H. Hulick, vice-president, and J. W. Weaver, secretary and treasurer.

## MANUFACTURING.

### Iron and Steel.

The McClintic-Marshall Construction Company, Park Building, Pittsburgh, operating the Pottstown Bridge Works, at Pottstown, Pa., have bought a site of land in the Monongahela Valley near Pittsburgh, and will erect upon it a complete structural plant. The exact location has not been decided upon, nor have definite plans been adopted for the new works, but the plant will be a large one and will give employment to a good many men. After the new plant is finished the McClintic-Marshall Construction Company will continue to operate the Pottstown Bridge Works for a time at least, but it is probable their manufacturing will all be done eventually at the new works in the Pittsburgh district. The McClintic-Marshall Construction Company have taken a contract for the building of a brass foundry for the Westinghouse Electric & Mfg. Company, at East Pittsburgh. They are also figuring on a large amount of additional work in the East, and expect to close some contracts in a short time.

The Belfont Iron Works Company, Ironton, Ohio, manufacturers of pig iron and iron and steel rails, are making arrangements to put in a wire drawing plant and also a wire nail factory. They are tearing down a portion of their old buildings, and putting up new ones in their places. The concern expect to have their wire drawing plant and wire nail factory in operation about the first of the coming year.

The Wilkes Rolling Mill Company, Sharon, Pa., manufacturers of muck bar, bar iron and iron and steel sheets, are now operating their new sheet mill, and advise us they have a large amount of orders on hand.

The Shelby Steel Tube Company of Cleveland, Ohio, advise us that they expect to start their plant at Ellwood City, Pa., in the very near future.

The Sandwich Iron & Steel Company, manufacturers of steel and iron, at Sandwich, Ill., J. P. Adams, president, announce that they will be ready to start their mill about the 20th of the present month. The firm will make billet stock from No. 1 wrought scrap, no busheling scrap or turnings being used. Their iron will be refined B. B. iron.

Fire on September 7 caused a loss of \$10,000 to the South Bend Foundry Company, South Bend, Ind.

A meeting of the creditors of the Continental Iron Company, operating plants at Niles, Ohio, and Wheatland, Pa., was held last week, when additional claims against the company were filed. The Fort Pitt Bank of Pittsburgh presented a claim of \$63,500; the Fourth National Bank of Pittsburgh, \$25,000; Girard Iron Company, \$112,605, and other smaller claims amounting to \$5,000. The schedules filed showed assets of \$338,605, and liabilities exceed this amount by \$112,000. An attempt was made to appoint a trustee to take charge of the sales of the firm, but the creditors could not agree upon any one man and the matter was put off for 30 days. It is said that the claim of the Girard Iron Company for \$112,605 will be opposed, as Henry B. Shields and J. D. Shields of the Continental Iron Company assert there is no foundation for the claim.

A change in the management of the Atlantic Tube Company, Pittsburgh, whose works are at Beaver Falls, Pa., has been made in the past few days, and the works were closed down while these changes were under way. The plant started up on full turn on Tuesday, September 11, and is expected to continue in full operation right along. The concern are manufacturers of seamless cold drawn steel tubing for boiler, automobile, carriage, bicycle, motor and pump construction. The general offices are in Room 1209 Park Building, and Robert D. McGonnigle is treasurer.

The Canonsburg Works of the American Tin Plate Company of Canonsburg, Pa., which have been idle for some time, have started up.

The Jansen Steel & Iron Company, with principal office at Oxford, N. J., have been incorporated, for the manufacture of railroad spikes. The capital is \$100,000, and the incorporators are Frank Jansen, Valentine Jansen, Joseph Jansen, Frank Kasel, Joseph Becker.

At the recent annual stockholders' meeting of the Dover Iron Company, Dover, N. J., Albert Richards was elected a director to succeed the late George Richards. All the other directors were re-elected. State Senator Mahlon Pitney, who was elected president of the company shortly after Mr. Richards' death, was re-elected to that office.

### Machinery.

Wm. Tod & Co., engineers, founders and machinists, Youngstown, Ohio, have received an order from the Republic Iron & Steel Company for a tandem compound engine, 40 x 80 inches by 60-inch stroke, to be used for driving the new continuous mill which the Republic Iron & Steel Company are about to erect at their Brown-Bonnell Works in Youngstown.

The Westinghouse interests at Pittsburgh have purchased the plant of the Pittsburgh Automobile Company at Swissvale, near Pittsburgh. The property comprises 3½ acres, on which is erected a large and substantial three-story brick factory, built a year ago but never equipped with machinery.

The Westinghouse Machine Company of Pittsburgh have purchased the old plant formerly operated by the Robinson-Rea Mfg. Company, on the South Side, Pittsburgh, and are operating it as a foundry. The capacity of the present plant of the Westinghouse Machine Company at East Pittsburgh is entirely inadequate to supply the demand for their engines.

The Babcock & Wilcox Company, manufacturers of water tube boilers and chain grate stokers, have made sales recently through their Pittsburgh office to the Crucible Steel Company of America, for the Anderson-Du Puy Works, of six 250 horse-power boilers and six chain grate stokers to the Pittsburgh Plate Glass Company, 33 boilers of 250 horse-power each and 50 chain grate stokers; Marion Electric Light Company, Marion, Ohio, two 250 horse-power boilers and two stokers; Chilled Rolled Foundry Company, Vandergrift, Pa., 500 horse-power boiler, with stoker; Iron City plant of the Pittsburgh Brewing Company, 200 horse-power boiler and 400-pound pressure boiler to the Lunkenheimer Company, Cincinnati, Ohio.

The Russell Machine Company of Pittsburgh will erect a steel building at Twenty-eighth street and Allegheny Valley Railway, in that city, 75 x 120 feet, and will install in it a 15-ton crane. The building will be used for repairing second-hand machinery, tools and boilers before placing them on the market for sale.

At the recent annual stockholders' meeting of the Scranton Forging Company, Scranton, Pa., all of the officers were re-elected, as follows: President and general manager, C. H. Pond; vice-president, A. L. Lewis; treasurer, Henry Belin, Jr.; secretary, E. F. Chamberlin.

The Hampden Automobile & Launch Company have been incorporated in Maine, to manufacture and deal in vehicles, vessels and machinery. The capital stock is \$100,000. President and treasurer, J. Frank Durgen of Springfield, Mass. Directors, William C. Eaton of Portland, Maine, J. Frank Durgen of Springfield, and Addison L. Green of Holyoke, Mass.

### Hardware.

Nicholson File Company, Providence, R. I., are very busy with their export business, the shipments to foreign countries frequently exceeding in a day's business those for domestic consumption. It has been found necessary to reinforce and otherwise arrange the individual file boxes to insure their safe arrival under favorable conditions of transportation, the outer cases being braced and iron strapped. Their methods of handling these foreign shipments are the result of accumulated experience acquired by the observation of their export travelers, and apparently the great care taken is appreciated by their customers abroad. Almost every city in Europe is represented by orders, and Australasia and Africa, the Orient, and the Spanish-American States show a generous sprinkling. The company advise us that through their London office and warehouse 700 customers at present on their books are served, and that 24 foreign Governments use their files. The last month's shipments exceeded in volume those of any previous month in the company's history.

Sheldon Axle Company, Wilkes-Barre, Pa., are adding to their plant a department for the manufacture of carriage and wagon springs, and expect to have it equipped and running shortly after the first of the year. They advise us that their spring plant will be one of the most complete in the country.

### Miscellaneous.

The Penn Radiator Company of Corry, Pa., have been granted a charter with a capital of \$100,000, and have succeeded the Corry Radiator Company. The incorporators are A. T. Walton, W. K. Naylor, C. P. Rogers, T. D. West and A. W. Williams. The Penn Radiator Company will make a complete line of two and three column loop radiators, as well as flue radiators, and are now making a pattern for same.

The Electric Enameling Company, Newark, N. J., have increased their capital stock from \$250,000 to \$1,000,000. This action is said to be a preliminary to erecting a large plant in the State.

The Runskool Metal Company of Kittery, Maine, have been incorporated with a capital of \$100,000, for the manufacture of composition and other metal. The incorporators are V. Skinner, W. H. Thorpe, F. E. Rowell, G. W. Foster, S. Joyce, G. W. Flax.

The Palmer-Nicholls Company of Providence, R. I., have completed plans for the establishment at Los Angeles, Cal., of a large plant for the manufacture of magnet wire and other kinds of wire for the transmission of electrical energy, from the finest insulated used in delicate electrical instruments to the heavy copper cables to convey strong currents. The machinery has been received, and the work of setting it up has commenced. The company are one of the largest of their kind in the world, employing at their plant in New Hampshire 4000 people. The possibilities of the Oriental trade induced them to establish a plant at Los Angeles. One order has already been received from San Francisco that will keep the factory busy for a long time.

The clerks employed in the offices of the Republic Iron & Steel Company, at Youngstown, Ohio, have been notified of a reduction in salaries. Those earning \$150 a month and upward are reduced 33 1-3 per cent., and those averaging \$100 and less are reduced from 20 to 30 per cent.



## The Iron and Metal Trades.

Within six weeks of a Presidential election a certain amount of hesitation and uncertainty would be natural under normal conditions. Under the peculiar circumstances affecting the iron industry the adverse effect is more pronounced in some branches while apparently quite the contrary results are developing in other directions. In Pig Iron and in Steel, in which prices have not yet quite receded to the level prevailing prior to the boom, many buyers are halting. In those finished materials, into which the knife was thrust to the bone, consumers and dealers show a disposition to contract far into the year 1901, arguing that if business is to be upset by the election it cannot crowd down values anyhow, while if it results as the great great majority of manufacturers hope, there may be substantial advance in prices. In other words, the election is being discounted to some extent where prices are at a low level.

The jerky movement in pig iron continues. Buying is on a fairly liberal scale, although patchy. Among the larger purchases is one lot of 10,000 tons of Basic for an Eastern Steel plant. Some very good export sales, too, have taken place.

Belated reports indicate that the export sales of Steel, in Billets, Sheet Bars, &c., during August were heavier than is generally known. It is asserted that they are continuing at a good rate, in spite of the almost universal complaint of difficulty in securing ocean freights.

Contrary to expectations, the boiling scale has not been settled at the last conference, but it is claimed that the arrangement made with some mills in the Chicago district by the officials of the Amalgamated Association is on a special basis more favorable than was pronounced the ultimatum to the two companies who are most largely employers of union men. The accusation of bad faith which is made is a very serious one for the officials of the Amalgamated Association.

The long idleness of the Western puddling mills has given Eastern works an opportunity to market some material in Western territory, this applying particularly to Skelp and Muck Bars. The former has advanced quite sharply and there has been more business in the latter. The market for Iron Bars is also firmer.

The activity in shipbuilding continues. On the Atlantic Coast the Maryland Steel Company have secured two large boats, while the American Shipbuilding Company have taken their initial order. East and West the Plate mills are taking heavy orders, but prices have not lately shown any disposition to strengthen.

Some good Structural contracts are coming up in different parts of the country. From one point of view a piece of work taken by the Pennsylvania Steel Company is of notable interest. It is for the erection of the Steel coal pier which the Norfolk & Western Company are about to provide at Hampton Roads specially for the coal export trade, thus showing that that business is regarded as certain enough to justify outlay for special facilities.

It is probable that the return of the leading men will make it possible to settle next week what is to be done in regard to Steel Rails for 1901. All reports which are afloat now are premature and untrustworthy.

The impression seems to have been gaining ground that the present low prices for many lines of Finished Iron and Steel are ruinous. They may be to some of the older and smaller mills, but there is good authority for the statement that to the concerns who control their own raw materials there is a fair manufacturing profit in the work, while in some lines the returns are still handsome.

## A Comparison of Prices.

At date, one week, one month and one year previous.

### Advances Over the Previous Month in Heavy Type. Declines in Italics.

	Sept. 2, 1900.	Sept. 5, 1900.	Aug. 15, 1900.	Sept. 13, 1899.
<b>PIG IRON:</b>				
Foundry Pig, No 2, Standard, Philadelphia.....	\$15.50	\$15.75	\$16.25	\$22.25
Foundry Pig, No 2, Southern, Cincinnati.....	13.75	13.75	13.75	20.00
Foundry Pig, No 2, Local, Chicago.....	15.00	15.50	16.00	21.50
Bessemer Pig, Pittsburgh.....	14.00	14.00	16.00	23.25
Gray Forge, Pittsburgh.....	14.00	13.50	14.00	20.50
Lake Superior Charcoal, Chicago.....	18.50	19.00	20.00	23.50
<b>BILLETS, RAILS, ETC.:</b>				
Steel Billets, Pittsburgh.....	17.00	17.50	18.00	28.50
Steel Billets, Philadelphia.....	19.50	20.00	20.50	41.00
Steel Billets, Chicago.....			20.00	41.00
Wire Rods, Pittsburgh.....	33.00	32.00	35.00	45.00
Steel Rails, Heavy, Eastern Mill.....	30.00	35.00	35.00	32.00
Spikes, Tied water.....	1.00	1.50	1.80	2.40
Splice Bars, Tied water.....	1.50	1.50	1.50	2.10
<b>OLD MATERIAL:</b>				
O. Steel Rails, Chicago.....	9.50	9.50	9.50	18.00
O. Steel Rails, Philadelphia.....	12.75	12.75	13.00	20.00
O. Iron Rails, Chicago.....	12.50	12.50	12.50	28.00
O. Iron Rails, Philadelphia.....	14.50	14.00	14.00	22.00
O. Car Wheels, Chicago.....	15.00	15.00	15.00	30.00
O. Car Wheels, Philadelphia.....	17.00	17.00	17.00	19.00
Heavy Steel Scrap, Chicago.....	9.00	9.00	9.00	16.50
<b>FINISHED IRON AND STEEL:</b>				
Refined Iron Bars, Philadelphia.....	1.25	1.30	1.30	2.06
Common Iron Bars, Youngstown.....	1.25	1.30	1.25	2.00
Steel Bars, Tied water.....	1.20	1.30	1.17½	2.35
Steel Bars, Pittsburgh.....	1.00	1.10	1.10	2.35
Tank Plates, Tied water.....	1.25	1.25	1.30	2.95
Tank Plates, Pittsburgh.....	1.15	1.10	1.10	2.85
Beams, Tied water.....	1.65	1.65	2.05	2.40
Beams, Pittsburgh.....	1.60	1.50	1.90	2.25
Angles, Tied water.....	1.65	1.55	1.95	2.40
Angles, Pittsburgh.....	1.40	1.40	1.80	2.25
Skelp Grooved Iron, Pittsburgh.....	1.40	1.40	1.25	2.25
Skelp, Sheared Iron, Pittsburgh.....	1.50	1.50	1.35	2.65
Sheets, No. 27, Chicago.....	3.05	3.00	3.05	3.40
Sheets, No. 27, Pittsburgh.....	2.85	2.90	2.85	3.10
Barb Wire, f.o.b. Pittsburgh.....	2.80	2.80	2.80	3.40
Wire Nails, f.o.b. Pittsburgh.....	2.20	2.20	2.20	2.80
Cut Nails, Mill.....	1.95	1.95	1.95	2.40
<b>METALS:</b>				
Copper, New York.....	16.75	16.75	16.50	18.50
Spelter, St. Louis.....	3.91	4.02½	4.00	5.50
Lead, New York.....	4.37½	4.37½	4.25	4.60
Lead, St. Louis.....	4.2½	4.32½	4.20	4.52½
Tin, New York.....	30.37½	30.75	31.50	32.75
Antimony, Hallett, New York.....	9.50	9.50	9.50	9.75
Nickel, New York.....	55.00	55.00	55.00	56.00
Tin Plate, Domestic Bessemer, 100 lbs., New York.....	4.84	4.84	4.84	4.82½

### Chicago. (By Telegraph.)

Office of The Iron Age, 1206 Fisher Building, 1  
CHICAGO, September 2, 1900.

A degree or two has this week been added to the activity of the market. Plates have come into a goodly share of the improved conditions. Two orders of 5000 tons each were placed and other smaller orders aggregating an even greater tonnage. In Sheets and Bars the heavy buying is pretty well out of the way for the present, but the aftermath is of fairly good proportions and prices have gained perceptibly in their slow climb upward. In Bars there is scarcity of stocks and values have been advanced another \$1 by some makers. Specifications for material are larger and more urgent, and the gradual resumption of consuming manufacturing plants gives notice that the summer inactivity is passing away. In a few directions there is still some hesitation due to unformed opinions respecting values or to the opinion that lower prices may be reached, but that obstructive feature is not generally present.

**Pig Iron.**—For several days last week there was marked improvement in the demand, then buyers became less insistent. Renewed perplexities as to relative production and consumption appeared, but already they are regaining confidence and are reappearing in the market, which is somewhat nervous and not uniform. For the moment Northern Irons seem to have the best of it in getting into the ownership of melters. Southern producers are with unimportant exceptions holding firmly to old quotations, the maximum figures quoted below being not unfrequently secured on current sales. There is a large amount of business hovering around, but is quite shy about getting seriously into the market. However the prospective buyers are not fully assured, apparently, that to stay out is desirable, and are offering a large tonnage at figures below the market, but are not finding acceptances. The current trade is active in the way it has been active for some time and the demand is slowly broadening. The small lot orders have been numerous and in tonnages ranging from 300 to 1000 and for deliveries running from one to four months. The aggregate business placed this past week has been quite large. Continuation of the present rate of buying in-

definitely would satisfy producers. Present prices are as follows:

Lake Superior Charcoal.....	\$18.50 to \$19.00
Local Coke Foundry, No. 1.....	15.50 to 16.00
Local Coke Foundry, No. 2.....	15.00 to 15.50
Local Coke Foundry, No. 3.....	14.50 to 15.00
Local Scotch, No. 1.....	15.50 to 16.00
Ohio Strong Softeners, No. 1.....	17.50 to 18.00
Southern Silvery, according to Silicon.....	17.85 to 18.35
Southern Coke, No. 1.....	16.35 to 16.85
Southern Coke, No. 2.....	15.35 to 15.85
Southern Coke, No. 3.....	14.85 to 15.35
Southern Coke, No. 1 Soft.....	16.35 to 16.85
Southern Coke, No. 2 Soft.....	15.35 to 15.85
Foundry Forge.....	14.35 to 14.85
Gray Forge and Mottled.....	13.85 to 14.35
Southern Charcoal Softeners, according to Silicon.....	17.85 to 18.35
Alabama and Georgia Car Wheel.....	20.85 to 21.85
Malleable Bessemer.....	16.00 to 17.00
Standard Bessemer.....	17.50 to 18.00
Jackson County and Kentucky Silvery, 8 per cent. Silicon.....	18.00 to 19.00

**Bars.**—For Steel Bars 1.30c. is the minimum quotation this week and \$1 higher from mill is not uncommon. The mills at Bay View have resumed after an idleness of ten weeks, and for both Iron and Steel the current demand is making inroads upon stocks. A majority of sellers have withdrawn from the market to the extent that they are not seeking trade and some are even discouraging buyers. This gives to the mills that are in a position to do business all the trade they can take care of. The smaller Iron Bar mills are crowded with work and are pretty independent both as to prices and deliveries. Stocks are in bad shape and orders by wire are numerous. Prices are firm at 1.35c. to 1.40c. From store Iron Bars are held at 1.65c., and Steel 1.50c. to 1.60c., with Hoops 1.90c. to 2c.

**Structural Material.**—Life is returning to the market and business this past week has been notably better than its predecessor. Contracts for two Milwaukee structures, one requiring 2000 and the other 1500 tons of Shapes, were let and the material bought. Small trade is also brisker. Much material is going into car construction and bridge work also is active. Quotations, mill shipment, are as follows: Beams, Channels and Zees, 15 inches and under, 1.65c.; 18 inches and over, 1.75c.; Angles, 3 inches and over, 1.55c.; Angles, under 3 inches, 1.30c.; Tees, 1.70c.; Universal Plates, 1.30c. From local yards small lots of Beams and Channels quoted 2.15c. to 2.35c.; Angles, 1.80c. to 1.90c. rates, and Tees, 2c. to 2.20c.

**Plates.**—A marked change has come in the character of buying in Plates, the market having broadened extensively. The heavy trade that waited for values to settle is buying generously, the material going into all kinds of consumption. Boiler makers, tank manufacturers, car builders, &c., are all in evidence, and 25,000 tons or more were sold within the past ten days. Prices are without change. From mill Tank Plates are quoted 1.25c. to 1.30c., and Flange 1.60c. to 1.70c. From store Tank is quoted at 1.55c. to 1.65c., and Flange 1.90c. to 2c.

**Merchant Pipe.**—Following the reduction in prices trade has slackened in some directions, but the season for consumption has not ended and there is a steady movement from mill and store to consumer. Manufacturers' prices, random length, are as follows:

	In carloads.	Less than carloads.
	Blk. Galvd.	Blk. Galvd.
1/4 to 1/2 inch and 11 to 12 inches.....	59.2 46.2	54.9 40.9
1/4 to 1 1/2 inches.....	66.7 53.9	61.9 48.9

**Sheets.**—The market is still active, though the rush of the previous week by way of large orders has not been repeated. Most of that business has been closed. There is, however, a good running trade in moderately sized lots. The late irregularity of prices seems to be pretty well eliminated. Light Black Sheets have advanced about 5 per cent., but Heavy Sheets are still weak. From store Common No. 27 is quoted at 3.20c. to 3.25c.; Nos. 10 to 14, 1.80c. to 2c., and No. 16, 2.10c. to 2.20c. Galvanized is 70 and 5 to 70 and 10.

**Merchant Steel.**—Some makers report a brisk, others a fair trade. Perhaps most of the large business has now been closed for the season and mills are well filled with orders. Prices are without further change. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 1.80c. to 2c.; Smooth Finished Tire, 1.80c. to 2c.; Open Hearth Spring Steel, 2.25c. to 2.50c.; Toe Calk, 2.50c. to 2.75c.; Sleigh Shoe, 1.75c. to 2c.; Cutter Shoes, 2.50c. to 2.75c.; Ordinary Tool Steel, 7c. to 7 1/2c.; Special, 13c. and upward.

**Rails and Track Supplies.**—The coming year is arousing some speculative interest, but as an actual factor of the market has no present consideration. There is a moderate inquiry for Light Sections and for corresponding Track Supplies. Values are without change. Quotations are unchanged, as follows: Rails are \$35 to \$37 for

Standard Sections, and \$27 to \$30 for Light Rails. Splice Bars, 1.50c. to 1.60c. Spikes are quoted 1.80c. to 1.90c.; Bolts, with Hexagon Nuts, 2.40c. to 2.50c.; Square Nuts, 2.30c. to 2.40c.

**Old Material.**—Views of buyers and sellers are getting wider apart. The sellers are inactive and exemplifying the quality of patience, for present demand is slight. But a tentative inquiry from a consumer brings out a higher quotation, which is not accepted by the consumer, and the fragile negotiation comes to an untimely end. If the seller makes the advances toward a transaction he encounters a low offer. Business, in a word, is very tame and uneventful, and, in the absence of activity, values are largely nominal. The following are approximate quotations per gross ton:

Old Iron Rails.....	\$12.50 to \$13.00
Old Steel Rails, mixed lengths.....	9.50 to 10.00
Old Steel Rails, long lengths.....	10.50 to 11.00
Relaying Rails.....	22.00 to 23.00
Old Car Wheels.....	15.00 to 15.50
Heavy Melting Steel Scrap.....	9.00 to 10.00
Mixed Steel.....	8.00 to 9.00
Iron Fish Plates.....	11.50 to 12.00
Steel or mixed do.....	10.00 to 11.00
Iron Car Axles.....	15.00 to 15.50
Steel Car Axles.....	14.00 to 14.50
No. 1 Railroad Wrought.....	11.50 to 12.00
No. 2 Railroad Wrought.....	10.00 to 10.50
Shafting, Iron and Soft Steel.....	15.00 to 16.00
No. 1 Wrought.....	9.00 to 9.50
No. 1 Country Wrought.....	8.00 to 8.50
No. 1 Mill.....	7.00 to 7.50
No. 2 Mill.....	5.50 to 6.00
No. 1 Busheling.....	8.00 to 8.50
No. 2 Busheling.....	7.00 to 7.50
Iron Car Axle Turnings.....	8.00 to 8.50
Soft Steel Axle Turnings.....	7.00 to 8.00
Machine Shop Turnings.....	6.50 to 7.00
Wrought Drillings.....	6.00 to 6.50
Cast Borings.....	4.00 to 4.50
Mixed Borings and Turnings.....	4.00 to 5.00
No. 1 Boilers, cut.....	8.50 to 9.00
No. 2 Boilers, cut.....	6.00 to 6.50
Boiler and Ship Scrap.....	8.00 to 8.50
No. 1 Cast.....	10.00 to 11.00
No. 2 Cast.....	7.00 to 8.00
Railroad Malleable Cast.....	10.00 to 10.50
Agricultural Malleable Cast.....	9.00 to 9.50

**Metals.**—For Copper the continued demand and the tone of the market is strong, with prices no higher. Lead is fairly active and unchanged in price. Lake is quoted 17c., and Casting, 16 1/4c. Lead has advanced to 4.32 1/2c. for Desilverized and 4.42 1/2c. for Corroding in 50-ton lots.

## Philadelphia.

Office of The Iron Age, Forrest Building, PHILADELPHIA, Pa., September 11, 1900.

The week opens somewhat auspiciously compared with the several immediately preceding, and the trade appear to be quite sanguine in expecting a more active market. Sales last week (particularly of Finished Material) were on a very liberal scale, so much so that sellers are now asking slightly higher prices. The demand for Skelp is specially active, and Muck Bars, which have been long neglected, are now attracting considerable attention. Holders who have carried them through the hot weather are not disposed to let them go now unless they can get some return for their outlay and patience, and are talking about \$2 per ton advance, which will probably have to be paid, as the supply is very small. The demand for Skelp is helping the Bar trade, and there are very few mills that would accept last week's prices, even for the best class of business. An advance of \$1 to \$2 per ton is asked, and buyers must make some concessions before an order is accepted, showing very clearly that for the present the seller has better control of the market than for some time past. Plates are active and firmer, but not quotably dearer. Pig Iron is the greatest puzzle; some are sanguine of a steady, firm and active market, but others are not confident in regard to prices, although they expect to see a heavier tonnage moving. Taking the week all the way through, however, it can be safely said that the feeling is better, and excepting Pig Iron, prices are a trifle higher.

**Pig Iron.**—It would be a rather strong statement to say that the market is better, but the feeling is so optimistic that many in the trade think it is better. In view of the furnace statistics published in last week's issue of *The Iron Age*, the market is better than might have been expected, but there is a feeling of reserve which does not indicate any great increase in confidence. Buying is undoubtedly on a larger scale, and is likely to continue so, but there is plenty of Iron and there is no difficulty in getting it on easier terms than at any time last month. The movement in prices has been so slight, however, that a difference of 25c. per ton would probably be a fair average of the decline, although in extreme cases 50c. may be noted. The feeling on this point is somewhat mixed. Some are disposed to maintain full prices, although they recognize the possibility of being



mistaken in that policy, but they say they are willing to take the risk. Others, having in view the certainty of reduced costs during the coming year, are meeting the market on the ground that they may as well do it at a small loss now, rather than risk a greater loss later on. Hence we have a wide range of prices, some quoting No. 2 X Foundry at \$16 to \$16.50, others taking \$15.50 to \$15.75 rather than lose a good sale. In the lower grades \$13.50 has been done for a fair quality of Gray Forge, and \$12.75 to \$13 for ordinary qualities. It is possible that still lower prices may have been accepted, but when exceptionally low prices are made they are for obvious reasons kept as quiet as possible. A large lot of so called No. 3 Foundry—but subject to an analysis which would make it No. 2 Plain—was sold at \$14.50 to one of the largest city buyers, and in other directions sales have been made at exceptionally low prices, although everybody says the market is better. A leading Southern furnace, which had instructed its agent to push sales at market rates, suddenly withdrew its offers, stating that they had sold 10,000 tons for export which would net a full \$1 better than could be done in the home markets; and so it goes, some up, some down, the net result, however, being a more active market, but with a very uncertain feeling in regard to prices, the range for Philadelphia and nearby points being about as follows: No. 1 X Foundry, \$17 to \$17.50; No. 2 X Foundry, \$15.50 to \$16.50; No. 2 Plain, \$15 to \$15.25; Mill Irons, \$14 to \$14.50; Ordinary, \$13.50 to \$14; Basic, \$14.25 to \$14.75; Bessemer, \$15 to \$16; Low Phosphorus, \$24 to \$25.

**Billets.**—There is not much new business being done, so that prices are more or less irregular. Asking prices are nominally \$20 to \$21, delivered, for either Bessemer or Open Hearth Steel, but it is thought that better could be done if the right kind of bids were made.

**Muck Bars.**—Prices are nominally \$23 to \$25 at mills, with an evident disposition to buy, providing that a good quality of Bar could be secured at the inside figure. We cannot quote definite transactions, but Muck Bars are wanted, and with the advance in Skelp, holders hope to get the full figure for Bars made from strictly neutral Pig. A good deal depends on location of mill, however, as the demand is chiefly from the West.

**Plates.**—There is a really good demand for Plates, and makers are firmer in regard to prices than they have been for some time past. The demand seems to come from all classes of consumers, but the most important buyers at present are the shipbuilders. The Maryland Steel Company have just entered the largest order they ever had for their shipbuilding department—viz., three steamships each over 500 feet in length. Other yards are also very busy. The American Shipbuilding Company have taken their first order, and will commence work on it immediately, while at Cramp's yard they are employing 7000 men, the largest number they ever had. The Wilmington yards are also very busy, so that the demand for shipbuilding purposes is bound to require a great deal of Steel. Further sales have been made on export account, and more lots are under negotiation for both the British and the Continental shipyards. The outlook as regards the volume of business is therefore very satisfactory, and although prices are low, they look like doing better in the near future. The usual quotations for city and nearby deliveries are about as follows: Plates,  $\frac{1}{4}$  inch and thicker, 1.25c. to 1.30c.; Universals, 1.30c. to 1.35c.; Shell, 1.35c. to 1.40c.; Flange, 1.50c. to 1.60c.; Charcoal Iron Plates, C. H. No. 1, 2.25c.; Best Flange, 2.75c.; Fire Box, 3.25c.

**Structural Material.**—There is a good demand, although the mills are not under as much pressure as they have been at some other times. The shipyards are taking a great deal of material, and prospects are considered to be very good for the fall and winter trade. Some business is also being done for export, besides a good run of orders from day to day buyers. Prices are as follows: Beams and Channels, 15-inch and under, 1.60c. to 1.65c.; Angles, 3 to 6 inches, 1.30c. to 1.40c.

**Bars.**—The Bar trade is very active and prices are firmer. The protracted suspension of work at many of the mills on account of the labor scale being unsettled is being felt in more or less of a shortage in supplies, and as the export demand is taking large quantities of both Bars and Skelp, the pressure may be still greater in the near future. The low prices of Steel Bars undoubtedly keep Iron in check, but it should cause no surprise to see a sharp advance in both Iron and Steel Bars. Prices at present are very irregular, some quoting 1.35c. to 1.40c., base, for Refined Bars, others may do 1.25c. to 1.30c., but there is a general tendency toward higher figures. Steel Bars, 1.20c. to 1.25c.

**Sheets.**—The demand for Thin Sheets keeps up remarkably, and mills are running to their full capacity on this class of work. Thick Sheets are comparatively

dull and neglected, but it is believed that greater activity will be met with in the near future. On ordinary business prices are about as follows, but on good sized orders concessions of half a tenth or thereabouts can be had for Best Sheets (Common Sheets two-tenths less): No. 10, 2.25c.; No. 14, 2.35c.; No. 16, 2.50c. Nos. 18-20, 3c.; Nos. 21-24, 3.10c.; Nos. 26, 27, 3.20c.; No. 28, 3.30c.

**Old Material.**—There is some business doing, but there is no great urgency on either side. Holders are firm, and when consumers need stock they have to pay pretty full prices, but it is a somewhat limited market at the present time. Bids and offers are about as follows for deliveries in buyers' yards: Choice Railroad Scrap, \$14.50 to \$15; No. 1 Yard Scrap, \$11.50 to \$12.50; No. 2 Light Scrap, \$10.50 to \$11; Machinery Cast, \$14.50 to \$15; Heavy Steel Scrap, \$11.75 to \$12.50; Old Iron Rails, \$14.50 to \$15.50; Old Steel Rails, \$12.75 to \$13.50; Wrought Turnings, \$8.50 to \$9; Cast Borings, \$6.75 to \$7; Old Car Wheels, \$17 to \$18; Iron Axles, \$15 to \$16; Steel Axles, \$15 to \$16.

## Pittsburgh.

Office of *The Iron Age*, Hamilton Building, Pittsburgh, September 13, 1900. {

(By Telegraph.)

**Pig Iron.**—We can note a better inquiry for Forge and Foundry Iron. In Bessemer demand continues for small lots only. None of the large Steel interests have bought any Bessemer Iron for months, and it will probably be considerable time yet before they are again in the market. Stocks of Bessemer Iron both at furnaces and at Steel works are very large and increasing. We continue to quote Standard Bessemer Iron at \$14, Pittsburgh. Forge Iron has shown no actual change in price, but is probably a trifle firmer. We quote Northern and local brands of Forge Iron at \$13 to \$13.25, Pittsburgh, but note that some Iron has been sold as high as \$13.50. We quote No. 2 Foundry at \$14.25 to \$14.50, f.o.b. Pittsburgh. We note a sale of 500 tons of Gray Forge at \$13, and also a sale of 200 tons at \$13.50, Pittsburgh, also a sale of 50 tons of Northern No. 2 Foundry at \$14.25, Pittsburgh.

**Billets.**—There is a little more inquiry for Steel, but prices are practically unchanged, the tone of the market being weak. We quote Bessemer Billets at \$17.50, Pittsburgh, but on a good specification it is possible that \$17, or perhaps slightly less, might be done.

**Sheet and Tin Bars.**—We continue to quote Sheet Bars at \$21, Pittsburgh. Lighter Bars are quoted at \$22.50 to \$23.

**Muck Bar.**—There have been sales in this market in the past week of from 3000 to 4000 tons of Standard Muck Bar at \$26 to \$26.25, delivered in Pittsburgh district. The starting up of additional mills has brought about a larger demand for Muck Bars.

(By Mail.)

The situation in Finished Material is steadily improving as to demand, and in spots prices are slightly better. However, there is no improvement as yet in Pig Iron or Steel, and with the steadily increasing stocks of Pig, it is somewhat doubtful whether permanent improvement in prices of Finished Material can come until there is betterment in the Pig Iron situation. In spite of a heavy decrease in production, stocks of Iron last month showed a large increase, and will probably do so this month. Until some relief is found for the heavy stocks of Pig Iron, they will probably prove a menace to the market. In Plates, Skelp, Pipe and Sheets there is a much better demand, and prices are slightly higher. Aside from the above there is nothing of special interest to note this week. The Wage Conference held in Detroit last week ended without result, and the puddling and bar scales are still unsettled. The situation as regards the scale is fully set forth in another part of this issue.

**Plates.**—There continues to be a good demand for Plates, a good deal of tonnage having been placed in the past week. As noted last week, a good deal of this has come from shipyards and boiler shops, both of which have been heavy purchasers. The tone of the market on Plates is stronger, and we quote Tank quality,  $\frac{1}{4}$ -inch and heavier, 1.15c.; Shell, at 1.25c.; Flange, 1.35c.; Fire Box is 1.50c. for medium quality, and 1.75c. to 2.25c. for best quality.

**Bars.**—There is a good deal of inquiry for Bars, and some consumers who made contracts several months ago at low prices have again come in the market recently, and made additional contracts at higher figures. There is also a good demand for Bars in small lots, and the leading mills are very comfortably fixed as regards tonnage. Prices are firm, and the minimum of the market on Steel Bars is 1.10c. for large lots, while the general market is 1.15c. to 1.20c., depending on the order. No settlement has been reached of the Bar Iron scale, and as a result most of the mills of Republic Iron & Steel Company and several of the American Steel Hoop Company are still idle. We quote Common Iron Bars at 1.25c., at Valley or Eastern mill, with freight to Pittsburgh added. Very few Common Iron Bars come into this market, as local consumers use high grade Bars, which are quoted at 1.70c. to 1.75c., at mill.

**Structural Material.**—No large contracts have been placed during the week. There is a good steady demand, and the mills are all pretty full of tonnage. Considerable work is coming up in the vicinity of Buffalo, N. Y., which is expected to be placed within a short time. We quote: Beams and Channels up to 15-inch, 1.50c.; over 15-inch, 1.60c.; Angles, 3 to 6 inches, inclusive, 1.40c.; over 6 inches, 1.50c.; under 3 inches, 1.25c.; Zees, 1.50c.; Tees, 1.55c.; Bars, 1.10c. to 1.15c.; Universal and Sheared Plates, 1.10c. to 1.15c., all f.o.b. Pittsburgh.

**Sheets.**—There is a very active demand for Sheets, buyers placing large orders and for extended delivery. This applies both to Black and Galvanized. The mills outside the leading interest are well sold up, and much firmer in their ideas as to prices. Several makers have advanced their figures in the past week. We quote No. 27 Black Sheets, Box Annealed, one pass through cold rolls, at 2.85c., and No. 28 at 2.95c. Corrugated Sheets, made of Common Iron, are quoted at about 2.70c. for No. 27, and 2.75c. for No. 28. We quote Galvanized Sheets at 75 per cent. off, f.o.b. maker's mill, no freight allowance being made.

**Merchant Steel.**—Demand does not show much betterment, and some low prices are being made in good sized lots. We quote Tire Steel at 1.50c. to 1.60c.; Toe Calk, 1.65c. to 1.70c.; Open Hearth Spring, 2.15c. to 2.25c., base; Open Hearth Machinery, 2.40c. to 2.50c.; Cold Drawn Steel Shafting, 60 per cent. off list; Tool Steel, ordinary grades, 7c., base; extra grades, 12c., base; terms 60 days, 2 per cent. off for cash in 10 days, with 25c. freight allowance on Tool Steel.

**Iron and Steel Skelp.**—There is an actual scarcity of Iron Skelp for prompt shipment, and some of the Pipe mills are paying good prices to get early delivery. There have been sales in this market in the past week of from 3000 to 4000 tons of both Grooved and Sheared Iron Skelp at prices ranging from 1.40c. to 1.55c., delivered, at buyer's mill. We quote Grooved Steel Skelp at 1.35c. to 1.40c.

**Tubular Goods.**—We can note a very heavy general demand for Pipe, and the mills are entering more tonnage than for months past. The tone of the market is strong, and we are advised that established prices are being rigidly held. In fact, there is no incentive now to cut prices owing to the large demand. To consumers, in carload lots, prices are as follows:

Merchant Pipe.			
	Black.	Galvd.	
	Per cent.	Per cent.	
1½ to 1¾ inch and 11 and 12 inch.....	61	48	
¾ to 10 inch.....	68½	56	
Casing, Random Lengths.			
	S. & S.	I. J.	
2 to 3 inch.....	55	48	
3¼ to 4 inch.....	60	56	
4½ to 12½ inch.....	65	61	
Casing, Cut Lengths.			
	S. & S.	I. J.	
2 to 3 inch.....	50	42½	
3¼ to 4 inch.....	56	51½	
4½ to 12½ inch.....	61½	57	
Boiler Tubes.			
	Up to 22 feet.	22 feet and over.	
	Per cent.	Per cent.	
Steel.			
1 inch to 1¾ inch and 2½ inch.....	55	50	
1½ to 2¼ inch.....	51	46	
2½ to 13 inch.....	62	58	
Iron.			
1 inch to 1¾ inch and 2½ inch.....	53	49	
1½ inch to 2¼ inch.....	49	44	
2½ inch to 13 inch.....	60	55	

**Connellsville Coke.**—Out of 20,428 ovens in the Connellsville region, 13,511 were active last week, and 6917 idle, the output having been 143,148 tons. Strictly Connellsville Furnace Coke is still quoted at \$2 a ton, but for good sized lots and prompt shipment this price has been shaded. We quote Foundry Coke at \$2.25 to \$2.50 per ton at oven. Main Line Coke—that is, Coke made outside the Connellsville region—is being sold at much lower prices than the above.

The Pittsburgh Steel Shafting Company of Pittsburgh, manufacturers of Turned, Rolled and Polished Steel Shafting and Square and Hexagon Bars, have opened an office at 38-41 East Atwater street, Detroit, Mich.

## Cleveland.

CLEVELAND, OHIO, September 11, 1900.

**Iron Ore.**—For the first time in several weeks some interest has been shown in the movement of "wild" Ore from the head of Lake Superior to Ohio ports. A block has been covered during the week at 70c. for transportation charges, which is a reduction of 5c. The contract was so small and the prospects for others to follow immediately are so slight that this one charter can hardly be taken to represent the market. Some little wild Ore is yet to be brought down, and it is believed that it will be carried at the old rate of 75c. Ore boats are no longer suffering for business, hence can demand their price with a reasonable hope of getting what they want so long as it is within bounds. Two cents is being paid on wheat from the head of the lakes, which is equivalent to a 75c. freight on Ore, and as grain boats are in excessive demand the owners will send their tonnage to Duluth and Chicago for grain rather than take less than 75c. for Ore. Contract tonnage continues to do most of the business for shippers, the wild charters being decidedly scarce. One condition is more favorable to the vessel owners than it has been. A week or so back the docks were filled with Ore and all of the legs of the unloading machinery were employed, giving incoming vessels very poor dispatch. The railroads have been furnishing more cars of late with which to move this Ore to the furnaces and as these latter are not preventing the shipment to their stock piles the lake port docks are getting in fair shape for the reception of the fall stock of Ore. This condition is most gratifying. It probably means that instead of the owners being compelled to go on the market and bid for boats later on to help them fulfill their contracts the regular tonnage set aside for that work will by November 1 have most of their contract stuff down the lakes, and will be able to indulge in other lines of trade. The very heavy sales of the finished material that have just been made must in time affect the amount of Ore being used, but it has not reached back that far yet. With the stock of Pig Iron that is now on the stock piles, and with the season of idleness on the part of the mills and the furnaces, it is believed that the amount of Ore that will be brought down the lakes, if the present rate of shipment is kept up, will about supply the needs of the consumers until the opening of the season of navigation next spring. There is little or no talk of sales of Iron Ore for the future, but some inquiries are beginning to appear, the idea seeming to be to spy out the prospects for prices, that the price of Pig Iron can be fixed for another half a year. The Ore men, while they have not agreed upon that point, seem disposed to demand that the present association prices shall prevail for next year, and are informing their trade that it would be safest to calculate Pig Iron prices with that point in view.

**Pig Iron.**—There is a decided change for the better in the Pig Iron situation. The sales have been heavier for the last week or ten days both for the present and for future delivery. The furnaces are in a very easy position now. The stock piles which increased in size rapidly during the period of depression in the Iron business are now dwindling slightly, the consumption being a little larger than the production, but they are by no means exhausted and are not likely to be immediately.

**Finished Material.**—In a general way it might be said that the Steel market is improved. Some few prices have gone up, while others are holding firm with better prospects for business. The Steel men believe that the reaction from the recent slump is now setting in and that the near future will see normal conditions again prevailing. The strongest feature of the entire market has been Plates. This is due to the fact that the entire capacity of the mills has been sold up for the remainder of this season and with a good volume of business in sight there is practically no stuff on hand to meet the demands. This condition is allowing those who have Steel to fix prices which are satisfactory to themselves, which has resulted in a general advance. Three prices are now being quoted on plates, 1.20c., 1.25c. and 1.30c., but 1.25c. seems to be nearest to reflecting the exact condition of the market. The shortage in the supply of Plates is due to the very heavy orders from the shipyards owing to the burst of shipbuilding that the lakes have seen during the last few weeks. The price of Bars is also stronger than it has been. The market is represented by quotations of 1.15c. and 1.20c. The demand is excellent and while the supply is not short it is none



too abundant, owing to heavy sales made of late. The demand for Shapes has not diminished in any way, there still being a very brisk trade. The building boom which has settled upon this section continues and the sales are heavy.

**Old Iron.**—This branch of the trade is looking up now in common with other branches. It might be said that the sales are larger on the specific grades that are selling, while the inquiries have been more general. The dealers who have a good deal of stock on hand are not overly anxious to unload as yet, feeling that the prices must rise soon. Stove Cast and Machine Cast are both selling well, with a slight demand occasionally for Old Rails. The prices remain unchanged.

### St. Louis.

Office of *The Iron Age*, 1205 Chemical Building, {  
St. Louis, September 10, 1900. }

(By Mail.)

**Pig Iron.**—There is a little improvement, so far as tonnage is concerned, but none to report in regard to prices. The largest known sale of the week specified 2000 tons of Eastern Basic Iron for local consumption. Quite a number of carload sales were made, and some for 100 to 200 tons. There is still a dearth of heavy buying, and it certainly seems that buyers are forced into the market by their customers' needs rather than from any inclination to replenish for stock on hand. Inquiries are being sent in by Stove manufacturers, and fair tonnage mentioned therein. Northern Irons, through various causes, are said to be edging their way into fields that geographically belong to Southern furnaces. Freight rate has something to do with it, but so far the interested lines are said to be averse to granting lower rates. Prices below show no change. We quote, f.o.b. cars, St. Louis:

Southern, No. 1 Foundry.....	\$15.50 to \$16.00
Southern, No. 2 Foundry.....	14.75 to 15.25
Southern, No. 3 Foundry.....	14.00 to 14.50
No. 1 Soft.....	15.50 to 16.00
No. 2 Soft.....	14.75 to 15.25
Gray Forge.....	13.25 to 13.75

**Bars.**—Market is of a more even tenor, and prices are showing firmness. Mills and jobbers speak of a steady consumptive trade that figures up into very desirable tonnage. There are vain regrets, no doubt, on the part of consumers who failed to take advantage of mill prices of a month or so past. To-day mills are in position to choose the buyer and the prices at which to enter the order. Mills prices are 1.35c. to 1.40c., base, half extras, for Steel; 1.45c. to 1.50c., base, half extras, for Iron. Jobbers quote carloads from mill at 1.65c., full extras, for Steel; smaller lots of Steel and Iron range from 1.75c. to 1.90c., full extras.

**Rails and Track Supplies.**—Buying continues in a very satisfactory way in Track Supplies to provide for immediate use. We quote: Splice Bars, 1.85c. to 1.90c.; Track Bolts, with Square Nuts, 2.40c.; with Hexagon Nuts, 2.50c.; Spikes, 1.85c. to 1.90c.

**Pig Lead.**—Market much the same as last week. De-silverized is still selling at 4.32½c. All brands are having a steady demand, with a tendency toward increasing sales. Judging by way shipments are being made, producers cannot have much stock on hand, as more or less delay is being experienced in the execution of orders. Lead Ore remained stationary at \$46 per ton.

**Spelter.**—Inquiry was better last week, and prices showed a stiffening. However, the entry into the market of a producer who had for some time banked fires brought prices down, and 3.90c. is the quotable price. While a fair number of inquiries were received this week, no notable sales can be mentioned. Zinc Ore sold at top price of \$28 per ton, but the principal tonnage purchases were made at \$27.

### Cincinnati. (By Telegraph.)

Office of *The Iron Age*, Fifth and Main streets, {  
CINCINNATI, September 12, 1900 }

The volume of Pig Iron business was considerably smaller than it was the previous week. This was especially so in Southern Irons, in which the trade seems to have been confined to lots of 100 tons and under, though in the aggregate there was a very fair tonnage for that sort of trading. Northern Irons were more active, and while not at all brisk, yet taken all in all, the market was far from dull. Buyers are still showing great conservatism, and are loath to accept the assertion that bottom has been reached in the matter of quotations. Prices are certainly no lower than they have been for the past three weeks, and the situation seems to have a firmness which

has been lacking for some months. While there are some furnaces refusing to acknowledge the present minimum figures, there are enough who think differently and are now willing to contract liberally on that basis. Trade is expected to show a steady though perhaps slow improvement, and prices will likely remain about where they are; that is the general opinion among authorities here. Freight rate from Birmingham is \$3.25 to this point; from the Hanging Rock district, \$1. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1.....	\$14.75 to \$15.25
Southern Coke, No. 2.....	13.75 to 14.25
Southern Coke, No. 3.....	13.00 to 13.50
Southern Coke, No. 4.....	12.00 to 12.75
Southern Coke, No. 1 Soft.....	14.75 to 15.25
Southern Coke, No. 2 Soft.....	13.75 to 14.25
Southern Coke, Gray Forge.....	12.00 to 12.75
Southern Coke, Mottled.....	12.00 to 12.75
Ohio Silvery, No. 1.....	18.25 to 18.75
Ohio Silvery, No. 2.....	17.25 to 17.75
Lake Superior Coke, No. 1.....	15.00 to 15.50
Lake Superior Coke, No. 2.....	14.00 to 14.50
Lake Superior Coke, No. 3.....	13.00 to 13.50

#### Car Wheel and Malleable Irons.

Standard Southern Car Wheel, chilling grades.....	\$22.00 to \$22.50
Standard Southern Car Wheel, No. 2.....	21.25 to 21.75
Lake Superior Car Wheel and Malleable.....	19.00 to 20.00

**Plates and Bars.**—The market has been rather quiet on an unchanged basis, and at this writing is considered firm. We quote, f.o.b. Cincinnati: Iron Bars, carload lots, 1.60c., with half extras; in small lots, 2c., with full extras; Bar Steel, carload lots, 1.70c., with half extras; small lots, 2c., with full extras; Iron Bar Angles, 1½ x 3-16 and larger, in car lots, 1.75c.; small, 2.25c.; Sheets, No. 10, 2.25c.; No. 27, Steel, 3c.; Plates, 2c. to 2.25c.

The Hamilton Furnace, belonging to the Hanging Rock Company, which has been out of blast for the past four months, was blown in on September 10, and will run on a mixture of Hanging Rock and Lake Superior Ores.

### Birmingham.

BIRMINGHAM, ALA., September 10, 1900.

A feeling of confidence seems to be growing apace, and is daily manifesting itself in the transactions that occur. No orders of magnitude excite the market, but those for moderate amounts are increasing in numbers. One favorable sign of a growing confidence in prevailing prices is the fact that buyers are, as a rule, accepting prices without that contention that has of late marked negotiations. The demand has been mainly for Foundry grades. No. 1 Foundry has sold at \$12, as has also No. 1 Soft, while Silver Gray has been sold at \$13. Some Basic Iron went at \$11 and some at a shade less. Some Gray Forge was booked for export at \$10 and \$10.50 during the week, while No. 2 Foundry found buyers at prices ranging from \$11 to \$11.50. There was during the past week thrown overboard a lot of Iron purchased at or near the top price during the advance. The price it brought was less than figures here quoted. The quantity was 2000 tons. It was a chance lot and a sacrifice sale. There are now 11, and perhaps 12, furnaces under control of this district out of blast, with an indefinite time set for the renewal of operations. It is safe to say that this indefinite time depends to a great degree upon the course of the Iron market. There is a feeling of unanimity among the fraternity that the bottom has been reached on Iron, and they feel that at present prices the trade will supply their wants without discontent. But no one expects, and no one desires, the rapid advances of a few months ago. The export trade continues to reach out for more Iron. Eight to ten thousand tons went out the past week, and shipments have been taken for more, as ocean room has been offered. The sales for the past week for export were approximately 15,000 tons. It is current "on dit" that almost all the ocean room available up to January, 1901, has been taken. Without disputing the assertion, it can be stated that on a squeeze some room can always be found that was overlooked. The leading interests admits that their foreign sales for August were 60,000 tons, for all of which ocean room has been engaged. It is a rare thing for a day to pass without good inquiry from the export trade. It is the safety valve to the Iron trade—the regulator of prices and the prop of the market.

Since the starting up of the Steel plant sales have been made to both the domestic and the foreign trade, and include Axle Steel, Billets and Slabs. But the prices obtained are represented by the cabalistic characters P. T.

To show the improvement in furnace practice that has been attained here by some interests, the results from two runs are here given. Output 156 tons, of which 18 tons were No. 1 Foundry, 107 tons No. 2 Foundry, 23 tons No. 3 Foundry, 2 tons No. 4 Foundry and

6 tons No. 2. Soft output 154 tons, of which 12 tons were No. 1 Foundry, 104 tons No. 2 Foundry, 7 tons No. 3 Foundry, 18 tons No. 4 Foundry and 13 tons No. 2 Soft. This is no special selection of special runs to make special showing, but your correspondent drew them out of a batch, eyes shut.

The Central Foundry Company have made a reduction in wages to their force in this district. All the various departments accepted the reduction but the Pipe department. They objected, but as orders were nominal the refusal does but little harm. Advice to a body of dissatisfied wage earners is nearly always unwelcome and useless, but one can hardly resist the inclination to suggest to them that "when you cannot get pudding, take pie." The course of the company was the result of slack business and lean profits.

It is declared, and by very reputable authority, too, that one interest here has sold the anticipated output, up to January, of their Nos. 2 and 3 Foundry. The Birmingham and Gate City Rolling Mills will, this week, complete the various extensive repairs upon which they have been engaged, and will be ready for business. It is anticipated that the scale will be agreed upon this week, and that work will be resumed at once.

The Dimmick Pipe Works are making haste slowly in getting their full capacity engaged. But when they announce they are all ready, it will mean that there are no oversights to remedy and no omissions to rectify. They have lately secured an important order for Pipe for an English market, and have good business secured to start on.

Contracts will be let this week for the foundation of the new \$300,000 hotel. This venture has encouraged the consideration of others, some of which are sure to materialize.

As illustrating the improvements going on architects and contractors estimate that 600 buildings of various kinds are being erected. The fever has excited municipal pride, and to keep pace with the public spirit of its citizens the municipality has determined upon the erection of a new City Hall at a cost of \$200,000. Securing the money (already tendered) by a bond issue. Faith in our future growth and prosperity is evidenced by such works.

## The British Iron Market.

**Summary.**—The position in the Iron and Steel trades continues fairly satisfactory, and prices are keeping up very well on the whole. Indeed, Pig Iron is rather stronger in some districts. There is some animation in this market now, and makers are looking to the future with more confidence. In the finished branches, too, there is a better feeling, and for several descriptions of manufactured Iron and Steel there is better inquiry. The engineering trades are active in most sections, but makers of textile machinery are not doing so much. The shipbuilding revival continues, and some good orders have been booked during the week. American advices are more favorable, and on the Continent the situation is unchanged. Business in Germany is fairly brisk, but in France and Belgium there is less activity.

**Pig Iron.**—Business in Pig Iron has improved slightly since our last. We are entering on what is usually a busy season of the year, and the better tendency now perceptible encourages the belief that this autumn will prove no exception to the rule. At the same time transactions are still of a somewhat limited character, and are mostly for early delivery, buyers being averse from operating forward. In the Cleveland district makers are expecting an improved Continental demand, and accordingly are by no means disposed to cheapen No. 3, which is the quality chiefly required for export, and which is now very scarce. The lower grades, on the other hand, are produced in excess of requirements, and some makers have a stock of these sorts. While, therefore, they are getting 71 shillings for No. 3, they cannot realize more than 67 shillings for No. 4 Foundry. This cheapness of the lower qualities, however, has one advantage, as it has brought about some revival of trade with Scotland. The demand for Hematite continues active, and makers are apparently unable to keep pace with it in Middlesbrough, while very similar conditions prevail in Barrow, where 83 to 84 shilling 6 pence is the price of mixed numbers. In regard to warrants there has been more doing in Scotch, which are dearer, and a good parcel of Cleveland has been sold at 72 shillings.

**Manufactured Iron and Steel.**—There is no material change to note in the manufactured branches of the trade; but there is, if anything, an improved tone, inquiries being more regular. Prices are steadily adhered to in most districts, makers securing £11 10s. for best Bars in South Staffordshire without difficulty, while in Lancashire also the list basis is insisted on, although the position of manufacturers there appears to be weaken-

ing. In Scotland Bars have been put down 10 shillings, and in Middlesbrough another reduction of 2 shillings 6 pence has taken place in Steel Rails. Steel makers are busy, and have plenty of orders on their books. In Barrow there is great activity at all the works, and new business is coming forward freely, while from Lancashire some slightly better reports are to hand regarding the demand for Steel for structural purposes.

**Engineering and Shipbuilding.**—In the engineering trades most branches are fairly active; but the textile machinery section continues unsatisfactory. On the other hand, special machine tool makers are still well supplied with work for some time forward, and a pressure of activity continues throughout all sections of electrical engineering and among firms engaged upon the manufacture of ordnance and the production of all descriptions of war material. The revival in the shipbuilding industry has given an impetus to work in the yards, and more inquiries for new boats have been received, together with some good orders. The Wear statistics for this month, however, compare unfavorably with those for August last year.

**Comparison of Prices.**—The annexed table shows the current prices compared with those of last week, and of the corresponding period last year:

	Aug. 30, 1900.	Aug. 23, 1900.	Aug. 31, 1899.
	s. d.	s. d.	s. d.
<b>Iron Ore—</b>			
Rubio, Middlesbrough.....	21 9	21 9	17 6
Rubio, Cardiff.....	30 6	30 6	15 9
Pottery Mine, North Staffordshire.....	30 6	30 6	14 6
Hematite, West Coast (at mines)....	19 6	19 6	16 0
<b>Pig Iron—</b>			
No. 3 Foundry, Middlesbrough.....	71 0	71 0	65 9
Warrants.....	72 0	72 0	65 8
Scotch Warrants, Glasgow.....	76 1	73 9½	67 11
Hematite Warrants, West Coast.....	80 9	80 10	71 0
Cold Blast (Foundry), South Staffordshire.....	130 0	130 0	110 0
Welsh Hematite, Cardiff.....	84 0	84 0	84 0
<b>Manufactured Iron and Steel—</b>	£ s. d.	£ s. d.	£ s. d.
Marked Bars, South Staffordshire.....	11 10 0	11 10 0	9 10 0
Common Bars.....	10 15 0	10 15 0	8 10 0
Steel Rails, Middlesbrough.....	7 2 6	7 5 0	6 7 6
Steel Rails, West Coast.....	7 5 0	7 5 0	6 5 0
Steel Rails, Cardiff.....	7 0 0	7 0 0	6 5 0
Steel Angles (eng.), Middlesbrough.....	8 10 0	8 10 0	7 10 0
Steel Angles (eng.), Glasgow.....	8 2 6	8 2 6	7 7 6
Steel Plates (ship), Middlesbrough.....	8 0 0	8 0 0	7 12 6
Steel Plates (ship), Glasgow.....	8 2 6	8 2 6	7 15 0
<b>Tin Plates, Bessemer IC Cokes, South Wales.....</b>	s. d.	s. d.	s. d.
	14 6	14 6	15 6

—Iron and Coal Trades Review, August 31, 1900.

## New York.

Office of The Iron Age, 232 234 William street, }  
New York, September 12, 1900 {

**Pig Iron.**—A moderate amount of business has been done, some of it coming from Cast Iron Pipe makers. Some further export sales are reported. Quotations are as follows at tidewater: Lehigh, Schuylkill and Virginia Irons, No. 1, \$16.50 to \$18; No. 2 X, \$15.25 to \$16.50; No. 2 Plain, \$14.25 to \$15.50; Gray Forge, \$13.75 to \$15. Tennessee and Alabama brands, No. 1 Foundry, \$16.25 to \$16.50; No. 2 Foundry, \$15.25 to \$15.75; No. 1 Soft, \$16.25 to \$16.50; No. 2 Soft, \$15.25 to \$15.75; No. 3 Foundry, \$14.25 to \$14.75; No. 4 Foundry, \$13.75 to \$14.25; Gray Forge, \$13.50 to \$14.

**Cast Iron Pipe.**—The inquiry for small lots continues good, but on larger contracts prices are being heavily cut. The largest order placed was 1000 tons for Holyoke, Mass., at private terms, the work going to a shop in the Philadelphia district. Next Monday an order for 2400 gross tons for Washington is to be let. We quote \$24 to \$24.50 for 8-inch Pipe at tidewater.

**Steel Rails.**—From second hands some Standard Rails are being offered from the West. One lot is 10,000 tons. The price asked, however, is altogether too high to tempt buyers, who expect to do as well as \$25 in any case, and are encouraged by apparently inspired interviews. We continue to quote nominally \$30 to \$31 for Standard Rails, tidewater. Light Rails are weak at \$25. We quote Spikes, 1.50c. to 1.75c.; Splice Bars, 1.35c. to 1.50c.; Square track Bolts, 2.25c. to 2.40c., and Hexagon Bolts, 2.35c. to 2.50c.

**Finished Iron and Steel.**—Locally no specially large contracts are reported. Some work is being held back in the hope of a further lowering in prices. Plates are still easy, at 1.20c., delivered, for Tank. The movement is slow in Cotton Ties this year, and is likely to remain so until old supplies are completely worked off. The requirements are estimated at 1,800,000 bundles. We quote as follows at tidewater: Beams, Channels and Tees, 1.65c. to 1.70c.; Angles, 1.30c. to 1.40c.; Tees, 1.65c. to 1.75c.; Bulb Angles and Deck Beams, 1.90c. to 2c.; Universal Mill Plates, 1.25c. to 1.30c. Sheared Steel Plates are—



1.20c. to 1.30c. for Tank, 1.35c. to 1.40c. for Shell, 1.50c. to 1.70c. for Flange, 2.10c. to 2.30c. for Fire Box, 3.50c. to 4c. for Locomotive Fire Box, on dock. Charcoal Iron Plates are held at 2.40c. for C. H. No. 1, 2.90c. for Flange, and 3.40c. for Fire Box. Refined Bars are 1.30c. to 1.35c.; Common Bars, 1.15c. to 1.35c.; Soft Steel Bars, 1.15c. to 1.30c., and Hoops, 2c. to 2.25c., base, on dock.

**Old Material.**—Nothing has been doing, the market being exceedingly dull. We quote Old Steel Rails nominally \$11 to \$11.50 and Old Iron Rails \$13.50 to \$14. Export business seems to be out of the question under present circumstances.

The Carbon Steel Company closed their Western office in the Fisher Building, Chicago, on September 1. The business heretofore transacted through that office will be done direct, either with their head office, Havemeyer Building, New York, or with their Pittsburgh office, Thirty-second and Smallman streets, Pittsburgh, Pa.

## Metal Market.

Office of The Iron Age, 232-238 William street, New York, September 12, 1900.

**Pig Tin.**—Business has been very quiet during the last week, spot declining to 30c. Prices became firmer to-day, however, on the strength of a London advance. At the close to-day spot was still a shade lower than last week, with the quotation 30.25c. bid and 30½c. asked. London closed at £136 for spot and £133 5s. for futures. Arrivals here since the first of the month amounted to 1840 tons, the greater portion of which is said to be still landing.

**Copper.**—Since our last report the situation has undergone a change worth mentioning. Business has fallen off, but prices have been advanced. It is universally admitted that September has thus far proved a disappointment as far as the volume of business is concerned. While buying has been only on a hand to mouth scale for some time past, the last week noted even less inclination to buy on the part of the large consumers. The exceedingly small exports thus far this month were also an unsatisfactory sign. But, notwithstanding, prices have not only been firmly adhered to, but where a week ago a quotation of 16½c. could have been secured, the parties are to-day holding strongly to 16¾c. to 16¾c. for Lake. Electrolytic is to-day quoted on 'Change at 16¾c., but metal merchants hold that none can be secured below 16¾, which price also holds for Casting Stock. London closed to-day at £73 10s. for spot and £74 flat for three-months' futures. This is an advance of 10 shillings on spot and 8s. 9d. on futures above last week's figures. Best Selected has advanced 10 shillings, to £79. Exports were very small, amounting to but 1500 tons during the first 11 days of this month.

**Pig Lead.**—There is no change whatever in this market. Conditions are the same as previously stated, and the American Smelting & Refining Company are still quoting 4¾c. for 50-ton lots, f.o.b. New York, and 4.32½c., f.o.b. St. Louis. London is unchanged, at £17 15s.

**Spelter.**—Is very weak. The metal is being freely offered at 4.10c. for spot and October, but it is stated that 4c. is the best bid obtainable. London has gone still lower in its record breaking quotation, the figure to-day being £18 15s. The talk of a combination of the Zinc smelters is again noticeable, but we can find no one here who is definitely informed as to the progress of the project. The options will expire on October 1.

**Antimony.**—No change is to be noted. Hallett's is quoted 9½c. and Cookson's 10½c.

**Nickel.**—Continues unchanged. Large lots are still unobtainable, and small quantities are bringing from 55c. to 60c.

**Quicksilver.**—A decline of 2 shillings 6 pence is quoted from London to-day. The price now cabled is £9 2s. 6d. This market has felt no effect of this, however, and prices quoted are still \$51 per flask of 76½ pounds for lots of 50 flasks and more.

**Tin Plate.**—The American Tin Plate Company are not quoting beyond September delivery. The prices which are being given are on a basis of \$4.84 per box of Standard 100-pound Cokes f.o.b. New York, or \$4.65 f.o.b. mills. While the scale of the Amalgamated Association has been settled no agreement has yet been made with the tanners. It is expected that a meeting to be held this week in this city will settle the matter. A decision will also be reached within a few days regarding the basis of prices for delivery later than September 20.

The New York Central owns or controls 10,280.65 miles of railroad.

## Shipbuilding at Sparrow's Point.

**SPARROW'S POINT, MD., September 11, 1900.**—The Maryland Steel Company, at Sparrow's Point, Md., have contracted with Boston capitalists for two large freighters of 12,800 tons when fully loaded. The dimensions are: Length, 505 feet over all, 488 feet between perpendiculars, 58 feet beam, molded, with a depth of 40 feet to the shelter deck. They are to maintain an average sea speed of 12 knots when loaded to 27 feet mean draft, in which condition they are to carry 11,200 tons dead weight.

These are to be three-deck vessels, with continuous shelter deck, and they are to be built under the survey of the British corporation. They are to have double bottoms for the whole length of the vessel, and a deep ballast tank under the engine room. There are nine cargo hatches, and the cargo will be taken care of with two steel masts and ten derrick posts, all fitted with booms. Twelve double drum hoisters will be fitted for operating these. The accommodations for the officers and crew are in a house on deck, officers forward and the crew aft.

These vessels are fitted with twin screws and triple expansion engines, with cylinders 23½, 39¼ and 63 inches in diameter by 45-inch stroke. They will work up to 200 pounds pressure, and will develop about 4000 horse-power. They are to be supplied with four single ended Scotch boilers, 15 feet in diameter by 12 feet in length, and will have three 45-inch furnaces in each boiler, provided with Howden's forced draft.

The boats will be supplied with feed heaters and independent pumps. They will also have evaporators for making up feed water. The bunker capacity will be 1200 tons. These boats are purely for freight traffic and have no passenger accommodations. They are the largest vessels of this class that have been contracted for in this country.

The keel has been laid for another vessel, contracted for in the latter part of August, to be built for the Boston Tow Boat Company, and to be a practical duplicate of the "Plelades" and "Hyades," built for the same parties (350 feet in length, 47 feet beam and 28 feet depth), both of which have been delivered, and which have shown exceptional fuel economy.

## The Cleveland Foundry Strike.

A dispatch from Cleveland states that after a ten weeks' strike there are no indications of a settlement of the difficulties existing between the foundrymen of that city and their molders. Secretary John A. Penton of the National Foundrymen's Association is still making his headquarters in that city, and expects to remain until enough men are secured to take care of the necessary work. Although two out of every three men brought to the city to take the places of the strikers are induced to leave again by the union pickets, it is claimed that fully 175 imported men are now at work in the various foundries of the city. It is claimed also that these men are of superior quality, and, unhampered by the restrictions of the union, they are enabled to turn out in some cases double the amount of work formerly performed by the union men. Secretary Penton claims that 50 additional men would be sufficient to take care of all present needs. The molders profess to be confident of success. From 600 the strike pay roll is said to have diminished to about 400, many of the men having left the city and secured work in other towns. It is asserted that the local union treasury has twice as much money in it as before the strike, owing to the money donated by other unions throughout the country.

One of the largest leather belts ever produced in this country was shipped to the Wabash Paper Company of Wabash, Ind., last week by the Bodifield Belting Company of Cleveland. The belt was 151 feet in length, 64 inches in width and weighed 2500 pounds. It was made from three thicknesses of leather from the very best steer hides, and necessitated the using of the centers of 360 hides. Perhaps the most remarkable feature of the transaction was the fact that the belt was made, packed and shipped within 43 hours after receipt of order.

The market on cold rolled shafting is reported to be considerably demoralized, and some very low prices are being made. We understand that in exceptional cases 60 per cent. off, and even 60 and 5 per cent., has been quoted. Established prices on shafting have not been observed for some time.

The Sheet mill which has just been completed by the Wilkes Rolling Mill Company, at Sharon, Pa., was started on August 30. The company are reported to have sufficient orders for Sheets to keep the mill running steadily for some time.

## Trade Publications.

**Hoisting and Conveying Machinery.**—A brilliant example of modern American catalogue work is furnished by the Brown Hoisting & Conveying Machine Company of Cleveland, Ohio, in the form of description of their equipment and products. As one of the oldest and most progressive of the concerns who have developed modern methods of handling materials, the Brown Hoisting & Conveying Machine Company have designed a very wide range of machinery. Foremost, of course, in the volume before us are the unloading devices first brought to perfection in the lake ore business. There are a series of splendid photographic reproductions of ore docks at various receiving ports, accompanied by a statistical diagram showing the growth of iron ore shipments from 1883 to 1899, and the fluctuations in the average annual freight rates during the same period. There are described also what the company call "Fast plants," in which the storage on the dock is limited or entirely eliminated, the machine being arranged to unload directly from vessel to cars, this being more particularly applied to iron ore. It is, however, used also for handling general merchandise to and from the cars, lighters and ships as in the case of the "Fast plant" on one of the Jersey City piers of the Pennsylvania Railroad. Another line, developed by Alexander E. Brown, is that of cantilever cranes, more particularly for use in ship yards. *The Iron Age* has in the past illustrated and described this new departure. The catalogue before us presents it in a series of beautiful illustrations. Another chapter of the book takes up the cantilever cranes on the Chicago Drainage Canal, and the use of cantilever cranes in iron and steel works, there being described, among others, the crane in the beam yard of the Rothe Erde Works near Aix la Chapelle, and the plant at the works of Jones & Laughlins. The gantry cranes, as applied to shipbuilding and to the unloading of materials in steel works yards, follow. Another chapter relates to coal and ore storage and ore storage and rehandling plants, conspicuous among which is the famous one at the Duquesne furnaces, at the Mariupol Works in Russia, at South Bethlehem, Punxsutawney, and Johnstown. Beautiful illustrations are presented of the coal storage plant of the Reading Company, at Cheektowaga, N. Y., the unloading towers of the Coxe plant at Chicago, and car dumping machines at various points. *The Iron Age* has already described the furnace hoist designed by Fayette Brown, which also finds a place in this publication. Finally there is presented a sewer excavating machine and cable ways at different points.

**Rock Crushing and Concentrating Machinery.**—The George V. Cresson Company, C. J. Buchanan consulting engineer, New York, have issued a well equipped catalogue descriptive of the latest designs of Buchanan rock and ore breakers, in which steel has been substituted almost entirely for cast iron in frame and working parts. A number of modifications in the design of the machine have been introduced. For large capacity the Cresson Company build the Duplex crusher. The pamphlet contains an interesting chapter comparing the jaw crusher with the gyrating type. It describes also the Buchanan portable crusher, the Buchanan granulator and the Plaster crusher. An improved pattern of the well-known Buchanan crushing rolls is described, and there are illustrations also of the toothed rolls. Among auxiliary apparatus we notice revolving cranes and belt conveyors. Mr. Buchanan has given much attention to the magnetic concentration of iron ore, and in the pamphlet before us describes and illustrates the plant at the Hibernia Mines, New Jersey.

**Emery and Corundum Wheels.**—The Vitrified Emery Wheel Company of Westfield, Mass., have prepared a pamphlet containing a map of the United States and tables showing the gold and silver production of the world, value of imports and exports of the United States, population of States and Territories, voting qualifications of the several States and Territories, popular and electoral votes for President in 1892 and 1896, and a blank table in which estimates can be placed of the probable vote of each State this year.

**Concrete Mixers.**—The Ransome & Smith Company, 17 Ninth street, Brooklyn, have issued a catalogue containing illustrated descriptions of their patented concrete mixers. Their drum mixer is a rotary barrel which is fed in batches through an opening in the center of one of the heads, and the material, after being mixed, is automatically discharged through an opening in the other head. It is portable and is adapted for use in the construction of sidewalks and walls, fire proof flooring,

railroad work and the general run of concrete work where the material must be thoroughly well mixed.

**Air Compressors.**—A catalogue from the Nordberg Mfg. Company of Milwaukee describes the several types of compressors built by them. All the compressing cylinders built by them, in which the air is compressed to over twice its original density, are water jacketed on the barrels as well as on the heads, in the most efficient manner. For lower degrees of compression no cooling is, as a rule, necessary. Thus blowing engines, compressing to 15 pounds or less, need no water jackets. Experience has shown that the cylindrical rocking valve, or the so-called Corliss valve, is the best adapted device for air distribution if properly arranged, proportioned and constructed, and if the gas to be compressed is reasonably free from grit, as is the case with atmospheric air. The types of compressors described are the single stage and two and three stage compressors, compound two-stage machines, two and three stage triple expansion compressors, and several patterns of natural gas compressors. The result of tests of a two-stage compressor showed the highest economy of steam so far recorded in the art of air compression, and also proved that the steam jacket is a very important device if high economy at all speeds is aimed at.

**Exhaust Fans, Blowers and Dry Kilns.**—We have received from the William Bayley & Sons Company of Milwaukee, Wis., a catalogue dealing with their steel plate exhaust fans, blowers and dry kilns. The most desirable size of their progressive dry kiln—that is, the one in most general demand, is 85 feet long, 17 feet wide and 9 or 10 feet high. This kiln will receive 12 cars, each of which is capable of holding 4000 feet of lumber. In addition two more cars are needed in each kiln for the loading and unloading platforms. Thus each kiln of the dimensions given has a total capacity of about 50,000 feet, while the lumber dried on each day ranges from one-seventh to one-fourth of the total amount, depending largely, of course, upon the condition of the lumber. The material to be dried is loaded upon cars and run into the kiln upon stationary trucks at the rate of two or more cars a day. Thus, as each day's quota is added, those preceding are gradually sent forward to the further end of the kiln, where the temperature ranges from 70 to 100 degrees higher than at the entrance. In this way the lumber is subjected to an even draft, gradually increasing in intensity until reaching the climax at the exit.

## United States War Vessels Building.

Two of the six new first-class battle ships building for the United States Navy are practically completed and another one is fast nearing that stage, according to a statement issued by the Bureau of Construction and Repair of the Navy Department. The "Alabama," which recently had her initial trial, is set down as 99 per cent. completed, and the "Wisconsin," which is scheduled to make her trial run on the Pacific Coast the latter part of this month, is stated to be 96 per cent. completed. The "Illinois," which will be the next of the big war ships to be launched, is building in Newport News, and stands at 85 per cent. Work on four of the sheathed protected cruisers has barely begun, and the other two, the "Denver" and the "Cleveland," stand 24 and 15 per cent., respectively. The four monitors are each about half completed. Of the torpedo boat destroyers, the "Lawrence" and the "MacDonough" are nearest completion, standing at 97 and 95 per cent., respectively. Eight of the new torpedo boats are nearly finished—the "Goldsborough" at 99 per cent., the "Stringham" at 98 per cent., and the "Bailey," the "Stockton," and the "Barney" at 96 per cent., the "Blakely" and "De Long" at 92 per cent., and the "Shubrick" at 90 per cent. respectively. The submarine torpedo boat "Plunger," building by the Trigg Company, stands at 85 per cent.

The National Tube Company have resumed operations in their mill at Chester, Pa., after several months of idleness. Two furnaces have been charged, which has given employment to a number of men, and the outlook is very bright for the coming winter.

The steel gondola cars recently ordered from the Pressed Steel Car Company of Pittsburgh by the Chicago & Alton Railway will be 43 feet 7 inches long and 10 feet wide, and the sides will be 3 feet high. They will have a capacity of 100,000 pounds each, will have steel trucks of the Voght pattern and New York air brakes with Tower coupler and Dayton draw bar attachments.



## QUOTATIONS OF IRON STOCKS DURING THE WEEK ENDING SEPTEMBER 12 1900.

Cap'l Issued.		Sales	Thursday.	Friday.	Saturday.	Monday.	Tuesday.	Wednesday.
\$20,000,000	Am. Car & Foundry, Common....	400	.....	-15	.....	.....	-15	-15
20,000,000	Am. Car & Fy, Pref. (7% Non-Cu.)	647	.....	-61	.....	61 3/4-62	.....	61 3/4
10,000,000	Am. Steel Hoop, Common.....	2,810	19 1/4-20	19 3/4-20	-19 1/4	.....	.....	19 3/4-20
14,000,000	Am. Steel Hoop, Pref. (7% Cu.)	1,040	68-68 1/4	-67 3/4	67-67 1/4	.....	-67	.....
50,000,000	Am. S. & W., Common.....	15,137	36 1/4-36 3/4	36 1/4-36 3/4	36 1/4-36 3/4	36 1/4-36 3/4	36 1/4-36 3/4	36 1/4-36 3/4
40,000,000	Am. S. & W., Pref. (7% Cu.)	2,985	75-75 1/4	-75	74 3/4-74 1/2	74 3/4-74 1/2	-75	75-75 1/2
28,000,000	Am. Tin Plate, Common, N. Y.	2,260	28 1/4-28 1/2	27 3/4-28	-28	-27 1/4	28-28 1/4	.....
18,225,000	Am. Tin Plate, Pref., N. Y. (7% Cu.)	2,000	30-31	30-30 1/4	.....	.....	-31	.....
7,500,000	Bethlehem Iron.....	100	.....	-57 3/4	-57	.....	.....	.....
15,000,000	Beth. Steel, Par \$50, \$1 paid in...	50	.....	.....	.....	.....	.....	-14 1/2
7,974,550	Cambria Iron, Phila*.....	61	-45 3/4	-45 3/4	.....	.....	.....	.....
16,000,000	Cambria Steel**.....	868	.....	16 1/2-16 3/4	16 1/2-16 3/4	16 1/2-16 3/4	16 1/2-16 3/4	-16 1/2
11,000,000	Col. Fuel and Iron.....	1,770	35 1/4-35 3/4	-35 1/4	35 1/2-35 3/4	35 1/2-35 3/4	35 1/2-35 3/4	35 1/4-35 3/4
46,484,300	Federal Steel, Common.....	3,535	.....	34 1/4-35 1/4	-34 1/4	35-35 1/4	35-35 1/4	34 1/4-35 1/4
53,253,500	Federal Steel, Pref. (6% Non-Cu.)	983	-67 1/4	.....	.....	66 1/2-67	67-67 1/4	-67
32,000,000	National Steel, Common, N. Y.	800	-2 1/2	.....	-26 1/4	.....	.....	-26 1/4
27,000,000	Nat'l Steel, Pref., N. Y., (7% Cu.)	1,136	-26	85 1/4-86	-86	.....	.....	.....
40,000,000	National Tube, Common, N. Y.	2,785	-46 1/4	-46 1/4	46 1/4-46 1/2	46 1/4-46 1/2	-46 1/4	46 1/4-46 1/2
40,000,000	Nat'l Tube, Pref., N. Y., (7% Cu.)	4,919	98-98 1/4	93 1/4-93 3/4	.....	-18 1/2	-18 1/4	13 3/4-14 1/2
5,000,000	Penna., Common, Phila.....	50	.....	.....	.....	.....	.....	.....
1,500,000	Penna., Pref., Phila.....	.....	.....	.....	.....	.....	.....	.....
12,500,000	Pressed Steel, Common.....	1,225	30-39 3/4	38 3/4-39 1/4	-39	-39 1/4	39 1/4-39 3/4	39-39 1/2
12,500,000	Pressed Steel, Pref. (7% Non-Cu.)	1,105	72 1/2-73	-72	-72	71 1/4-72	-72	.....
27,191,000	Republic Iron & Steel, Common..	1,515	-13	12 3/4-13	.....	12 3/4-12 3/4	12 3/4-12 3/4	12 1/4-12 3/4
20,306,000	Repub. Iron & Steel, Pref. (7% Cu.)	1,490	.....	.....	-54	53 1/2-53 3/4	-54	-54
7,500,000	Sloss-Sheffield S. & I., Common..	.....	.....	.....	.....	.....	.....	.....
6,700,000	Sloss-Sheffield S. & I., Pref. (7% Non-Cu.)	.....	.....	.....	.....	.....	.....	.....
20,000,000	Tennessee Coal and Iron.....	8,260	69 1/2-70 1/4	69 1/2-71 1/2	-70	67 3/4-70 1/4	69 1/2-70 1/4	70-70 1/2
1,500,000	Warwick Iron & Steel (par \$10)...	415	.....	.....	.....	.....	-8 1/4	-8 1/4

\* Par \$50. \*\* \$9 per share paid in. † 6% guaranteed by Feth. Steel Co. Late Philadelphia sales by telegraph. ‡ Ex-di-ident.

**Read and bid.** Am S & W., \$130,656; Am. Tin Plate, none; Am. Steel Hoop, none; Cambria Iron Co., \$2,000,000 6% debenture 20 year bonds 1917, payable option 5 years, assumed by Cambria Steel Co.; Federal Steel Co., \$9,822,000 Illinois 5%, \$7,117,000 E. J. E. R. R. 5%, \$1,600,000 Johnson 6%, \$1,782,000 D. & I. R. R. 5%, \$1,000,000 D. & I. R. R. 6%, \$10,000 land grant D. & I. R. R. 5%; National Steel, \$561,000; National Tube, none; Tennessee C. & I. R. R. Co., \$8,367,000 6%, \$1,114,000 7%, \$1,000,000 7% c. a. pref.; Pennsylvania Steel, \$1,000,000 6%, Steelton, 1st, 1917 \$2,000,000 5%; Steelton's Point, 1st, 1922, \$1,000,000 consolidated, both plants; Bethlehem Iron, \$1,351,000 5% maturing 1907. Interest and principal guaranteed by Bethlehem Steel Co. Republic Iron & Steel, none; Warwick Iron & Steel, none; Colorado Fuel & Iron Co., Col. Fuel Co. Gen. Mort. 6% \$250,000, Col. Coal & Iron Con. Mort. 6% \$2,810,000, Col. Fuel & Iron Gen. Mort. 5% \$2,303,000. Also outstanding \$2,000,000 preferred stock with accumulated dividends of \$640,000 to June 30, 1899. Sloss-Sheffield St. & I. Co., Sloss I. & S. first mortgage 6%, \$2,000,000, Sloss I. & S. general mortgage 4 1/2%, \$1,815,000.

## Iron and Industrial Stocks.

Transactions in the Steel stocks have been on a moderate scale during the past week, with prices well sustained during the whole period. Fluctuations were consequently quite narrow.

	Bid.	Asked.
American Bicycle Company, Common.....	6	6 1/4
American Bicycle Company, Preferred.....	27	31 1/4
American Bicycle Company, Bonds.....	70	80
E. W. Bliss, Common.....	.....	137 1/4
E. W. Bliss, Preferred.....	125	.....
Cramp's Shipyard Stock.....	75	80
Diamond State Steel.....	3 1/4	4
International Pump, Common.....	18 1/4	19 1/2
International Pump, Preferred.....	66 1/2	67
Otis Elevator, Common.....	26	27
Otis Elevator, Preferred.....	86 1/2	87 1/2
Pratt & Whitney, Common.....	3 1/2	5
Pratt & Whitney, Preferred.....	50	55
U. S. Projectile.....	95	100
Tidewater Steel.....	7 1/4	8
U. S. Cast Iron Pipe Company, Common.....	3 1/4	4 1/4
U. S. Cast Iron Pipe Company, Preferred.....	27	32
H. R. Worthington, Preferred.....	.....	110
Empire Steel, Common.....	6	10
Empire Steel, Preferred.....	30	36

The annual meeting of the New Haven Iron & Steel Company will be held at Camden, N. J., on October 1. The annual report of the company for the year ended August 31 shows:

Gross earnings.....	\$333,019
Net earnings.....	159,875
Dividends.....	80,000

Surplus..... \$79,875

The company manufactured 18,000 tons of bar iron and sold 17,600 tons. The highest received per ton was \$50.85, lowest \$35.75, averaging \$45.50. The average profit was \$9.85.

The Colorado Fuel & Iron Company have declared a dividend of 8 per cent. on their preferred stock for the fiscal year ended June 30, 1899, payable October 10. Books close September 20 and reopen October 11. This leaves arrearages of only 8 per cent. on the stock—namely, for the fiscal year ended June 30, 1900.

The Colorado Fuel & Iron Company report for July net earnings of \$229,800, against \$77,600 last year, an increase of \$152,200.

The National Steel Company have declared a quarterly dividend of 1 1/4 per cent. on their preferred stock, payable September 20. Books close September 15 and reopen September 30.

The Niles-Bement-Pond Company have declared a dividend of 1 1/2 per cent. on their common stock, payable September 20. Books close September 15 and reopen September 21.

The Bethlehem Steel Company received on September 1 a telegraphic order for a port propeller shaft to replace the one which broke in the Plant Lime

steamship "La Grande Duchesse" while off Halifax recently. The owners of the vessel specified that the shaft should be made of fluid compressed open hearth steel, forged under hydraulic pressure, annealed and rough turned, and the order was booked for shipment September 11. The shaft measured 32 feet over all by 13 1/4 inches diameter, and the shipping weight was 15,458 pounds. It was taken in hand under emergency instructions and went forward September 6, five days in advance of requirements.

## The New York Machinery Market.

Office of The Iron Age, 282-288 William street,  
New York, September 12, 1900.

Purchases are now being made on an extensive scale by the subcontractors who are to build the various sections of the New York Rapid Transit Underground Railway. It will be recalled that the contract for this entire work was awarded to John B. McDonald of the Park Row Building, New York. Mr. McDonald divided the work into fifteen sections and sublet contracts for them. Each of the contractors who are to build the various sections will perform all work complete on the sections which were awarded to them. Besides the machinery and apparatus required in performing the work of tunneling the respective contractors will equip their sections complete, this work requiring ventilating plants. There will be numerous stations along the route, each requiring lighting and ventilating apparatus. Contracts will be awarded at a later date especially for the building of these stations. Several million dollars will be spent in this manner. The tunneling in all sections above Union Square will require considerable rock drilling and blasting. For this purpose certain of the contractors are purchasing air compressing plants and the necessary accessories. The contracts provide that much of the work in connection with the assembling of the structural steel work shall be performed on the scene of operation. Consequently innumerable small forges, power hammers and like materials will be required. In certain of the sections, running through Harlem, viaduct work will be necessitated, where the road emerges from the tunnel and runs overhead. It will thus be seen that each of the subcontractors will require a temporary machine shop on the spot as well as the numerous requisite tools and apparatus scattered along the line. Work is now being started simultaneously on all sections. Certain of the contractors have already purchased some of their equipment, but all are now arranging for the purchase of much that will be required. Throughout the three years which will be required in the completion of the work the subcontractors will continually be in the market for materials necessary in furthering the progress of the work.

Following is a list of the contractors to whom sub-contracts have been let thus far:

Section 1 and 2.—The Degnon-McLean Contracting Company, Park Row Building, New York.

Section 3.—Holbrook, Cabot & Daly, 44 Union Square, New York.

Section 4.—Ira A. Shaler, 27 William street, New York.

Sections 5 and 6.—William Bradley, Eighty-sixth street and Broadway, New York.

Sections 7 and 8.—E. J. Farrell and John J. Hopper, Hamilton Bank Building, 215 West 125th street, New York.

Section 9.—John C. Rodgers, 31 West 125th street, New York.

Section 11.—John Shields, Hamilton Bank Building, 215 West 125th street, New York.

Sections 13 and 14.—L. B. McCabe & Brother, 157th street and Broadway, New York.

Sections 10, 12 and 15, which will include the viaduct work.—Terry & Trench Construction Company, 130th street near Lexington avenue.

The Degnon-McLean Contracting Company, who are to build the first two sections, are now erecting a temporary shop on New Elm street. Their work will consist entirely of open cut excavation.

Holbrook, Cabot & Daly are now building an air compressor plant on the Seventeenth street side of Union Square. Section 3, which they are to build, is about 8500 feet long, running from Great Jones street to Thirty-third street. Considerable rock work is encountered in this section. They have purchased two 25 x 30 inch Ingersoll & Sargeant air compressors, 500 horse-power of Gem City boilers, made by the Gem City Boiler Works of Dayton, Ohio; 10 drills, 15 hoisting engines, and various other tools.

Ira A. Shaler is now preparing specifications for an air compressing plant and machine shop which will be required in the construction of section 4.

William Bradley, who is building sections 5 and 6, is now fitting up his plant. Two cableways have been purchased. One of these will be operated by steam and furnished by the Carson Trench Machine Company of Boston. The other will be electrically equipped and has been procured from William F. Brothers of New York. A number of steam drills have been purchased from the Rand Drill Company, and a set of stone crushers are to be furnished by the Good Roads Machinery Company of Centre Square, Pa. Several locomotive type boilers will furnish the steam. Hoisting engines and other apparatus are still to be obtained.

E. J. Farrell and John J. Hopper are now buying their equipment.

John C. Rodgers is preparing specifications for the machinery which he will require in building section 9. This section includes the tunnelling of the Harlem River. Consequently floating derricks, dredges and conveying machinery will be required.

John Shields is purchasing material for the construction of section 11.

L. B. McCabe & Brother have purchased two 24 x 30 inch Rand compressors and are in the market for two more. Sixteen air drills have already been obtained and many more will be required. Boilers have been purchased from the Erie City Iron Works and the Gem City Boiler Works of Dayton, Ohio.

In the machine tool quarter merchants have been encouraged by a number of good projects which are about to be closed and several good transactions which went through during the week under review.

A large paper and pulp machinery building concern placed a number of substantial orders. They included a 28-inch Pond lathe, a 26-inch Pond planer, two large boring mills and a 22-inch lathe, which were ordered from the Niles Tool Works Company; a large Ingersoll slab miller and a Morton keyseater, which were purchased from Walter Foster, and an American turret lathe and a large screw machine, which the Prentiss Tool & Supply Company sold. Numerous tools of smaller, ordinary types were also purchased.

A plate glass manufacturing company placed an order for 14 machine tools, including several heavy classes, with a Liberty street house which is located between L roads.

Specifications are now going the rounds for a large batch of machine tools.

Parties will soon be in the market for a large amount of machinery for the equipment of a new automobile factory. The shop is to be built at Rutherford, N. J., by the Hercules Motor Company. Ground will be broken for the buildings within a week or ten days. Walter K. Freeman, Room 2028 Park Row Building, New York, is the engineer who has the matter in hand. Further details will be forthcoming shortly.

We are informed on good authority that extensive changes are contemplated by the Electric Vehicle & Transportation Company of this city. This company are

the operating end of the Columbia & Electric Vehicle Company of Hartford. They control the electric cab service of New York City. At present they are located on Eighth avenue and Fifty-third street. It is said that they have acquired by lease or purchase the old Eighth avenue car stables, and will shortly renovate them, adapting them to their purpose. An elaborate electric crane and hoist system will be required for handling the storage batteries which are to be recharged at the new plant. An extensive machine shop will also be installed for repairing the motors and making new parts for the vehicles in use.

In previous issues we have referred to the moving of the plant of the Grant Machine Tool Company from Cleveland, Ohio, to Franklin, Pa. Arrangements have been practically completed, and we are informed that a plant four times the size of the present one will be built at Franklin. The company are said to be in the market for a power generating plant, and arrangements are being made for the purchase of a large quantity of machine tools. Robert Grant was in this city last week sounding the market and making preliminary arrangements for the acquisition of the new equipment.

Considerable speculation is being indulged in by the trade regarding the outcome of the various schemes which have been suggested toward the continuance of the old Rodgers Locomotive Works of Paterson, N. J. The original project of disposing of the works to the citizens of Paterson, N. J., has fallen through, and now there is talk of moving the works to Newark, N. J., it being said that certain capitalists in that city are showing interest in the matter. The company are said to have had an especially prosperous year in 1899, and it is said that the principal reason for Mr. Rodgers' desire to leave the business in other hands is that he has recently lost his right hand man, who practically ran the affairs of the company for a number of years past. It is felt in the trade that if a new company acquire control of the plant, one of the first things which will be done will be the purchasing of almost an entire new equipment of machinery.

The Richmond Electric Company of Manchester, Va., are said to be inquiring about for a good sized equipment of machine tools. The company were recently formed for the manufacture of electrical machinery. George C. Scott, the secretary of the company, is said to be looking for the equipment. The buildings have just been contracted for.

An order has been given to the Hyatt Roller Bearing Company for a complete equipment of roller bearings for the new shop of the Goulds Mfg. Company of Seneca Falls, N. Y.

Following are the awards which have been made for supplies for the Boston Navy Yard, bids for which were opened on August 14:

Class 1.—One key seating machine, Manning, Maxwell & Moore, \$430.

Class 2.—One gear planing machine, Fellows Gear Shaper Company, \$1292.

Class 3.—One horizontal boring, drilling and milling machine; Manning, Maxwell & Moore, \$4170.

Class 4.—One vertical eight-spindle multiple drill, Hill, Clarke & Co., \$1074.

Class 5.—One 60-inch boring and turning mill, Manning, Maxwell & Moore, \$2195.

Class 6.—One 18-inch slotting machine, will be purchased in open market.

Class 7.—One 2-inch improved automatic bolt cutter, Drew Machinery Agency, \$374.

Class 8.—One 12-inch swing engine lathe, American Tool Works Company, \$163.

Class 9.—One No. 3 centering machine, Prentiss Tool & Supply Company, \$82.

Class 10.—One 15-inch improved shaping machine; will be purchased in open market.

Class 11.—One improved universal tool and cutter grinder, Walter H. Foster, \$215.

Classes 12 and 13.—Two 28-inch vertical drills and one arbor press; will be purchased in open market.

Class 14.—Three universal radial drills, Prentice Bros. Company, \$2700.

Class 15.—One dovetailing machine; will be purchased in open market.

Class 16.—One combined jointing, edging and timber ripping saw, S. A. Woods Machine Company, \$690.

Class 17.—One triple drum sander, Berlin Machine Works, \$1250.

Class 18.—Steel angle bars; no award, readvertised.

Class 19.—Steel plates, J. B. Kendall, \$12,068.50.

Class 20.—About 20,000 pounds seamless drawn copper piping, Manhattan Supply Company, \$5,948.53.

Class 21.—10,000 B. B. hewn teak, Chas. Este, \$13,000.

Class 22.—1400 feet fire hose, Eureka Fire Hose Company, \$826.

Class 23.—One 10-ton locomotive crane; not yet decided.



# MACHINERY AWARDS AT PARIS.

From the official lists which have reached us we compile the following awards given in Groups IV and V, under the different classes:

## GROUP IV.

### Class 19.—Steam Engines.

#### GOLD MEDAL.

Ball Engine Company.  
Wm. Sellers & Co. (Incorporated).

#### SILVER MEDAL.

Wheeler Condenser & Engineering Co.  
Lunkenheimer Company.  
Clonbrock Steam Boiler Company.  
Crane Company.  
Schaeffer & Budenberg.  
Lee Injector Mfg. Company.  
Ashton Valve Company.  
Walworth Mfg. Company.

#### BRONZE MEDAL.

Forbes & Co.  
American Steam Gauge Company.  
Ambler Asbestos Air Cell Covering Co.  
Keystone Engineering & Mfg. Company.  
Mosher.  
Taunton Locomotive Mfg. Company.

#### HONORABLE MENTION.

Direct Separator Company.  
De Rycke.  
Sherwood Mfg. Company.  
MacDoudland.  
United States Metallic Packing Co.  
H. W. Johns Mfg. Company.  
Fiske Brothers Refining Company.

### Class 20.—Various Motors.

#### SILVER MEDAL.

Aug. Mietz.  
Smith Company.  
Rider Ericson Engine Company.

#### BRONZE MEDAL.

Pelton Water Wheel Company.

#### COLLABORATORS.

#### BRONZE MEDAL.

Marlit, Aug. Mietz.

### Class 21.—Different Mechanical Apparatus.

#### GRAND PRIX.

Batcheller Pneumatic Tube Company.  
Henry R. Worthington.  
Otis Elevator Company.  
Blake Mfg. Company.

#### GOLD MEDAL.

Olsen & Co.  
Ingersoll-Sergeant Drill Company.  
Otis Elevator Company.  
Rand Drill Company.  
C. A. Schieren & Co.  
Shaw Electric Crane Company.  
Crane Company.

#### SILVER MEDAL.

American Steel Pulley Company.  
Tyler & Co.  
Robins Conveying Belt Company.  
Lunkenheimer Company.  
Monarch Governor & Machine Company.  
Rice Gear Company.  
Thomson Meter Company.  
Walworth Mfg. Company.  
Chapman Valve Mfg. Company.

#### BRONZE MEDAL.

Ashton Valve Company.  
Jeffrey Mfg. Company.  
Neptune Meter Company.  
Stillwell-Bierce & Smith-Vaile Co.

#### HONORABLE MENTION.

Henderson's Sons.  
The Bristol Company.  
Christensen Engineering Company.  
Lock Regulator Company.  
Winkley.  
Dresser.

#### COLLABORATORS.

#### GOLD MEDAL.

Otis (Charles Rollin), Otis Elevator Co.  
Anderson (Alfred), Olsen & Co.

#### SILVER MEDAL.

Wheeler (F. M.), Blake Mfg. Co.  
Anderson Arvyod, Olsen & Co.  
Hansen Anton.

### Class 22.—Machine Tools.

#### GRAND PRIX.

Brown & Sharpe Mfg. Company.  
Pratt & Whitney Company.  
E. W. Bliss Company.  
Niles Tool Works Company.  
J. A. Fay & Egan Company.  
Simonds Mfg. Company.

#### GOLD MEDAL.

Chicago Pneumatic Tool Company.  
Morse Twist Drill & Machine Company.  
Cincinnati Milling Machine Company.  
Hendey Machine Company.  
Warner & Swasey.  
Norton Emery Wheel Company.  
Bement, Miles & Co.  
E. C. Atkins & Co.  
Gisholt Machine Company.  
Jones & Lamson Machine Company.  
F. E. Reed Company.  
Deering Harvester Company.  
Bullard Machine Tool Company.  
Pond Machine Tool Company.  
Ferracute Machine Company.

#### SILVER MEDAL.

Cleveland Twist Drill Company.  
William P. Healy.  
Rice Gear Company.  
Landis Tool Company.  
Prentice Brothers Company.  
Q & C Company.  
Walworth Mfg. Company.  
L. S. Starrett Company.  
Morgan Machine Company.  
Gleason Tool Company.  
Flather & Co.  
Springfield Machine Tool Company.  
Clough-Rockwell Company.  
Baker Brothers.  
Acme Machine Company.  
E. Horton & Son Company.  
Ingersoll Milling Machine Company.  
Becker-Brainerd Milling Machine Co.  
Fellows Gear Shaper Company.  
Gould & Eberhardt.  
Curtis & Curtis.  
H. B. Smith Machine Company.  
W. S. Doig.  
Flather Planer Company.  
John Becker.

#### BRONZE MEDAL.

Bickford Drill & Tool Company.  
Cincinnati Planer Company.  
Standard Pneumatic Tool Company.  
A. D. Quint.  
R. K. Le Blond Machine Tool Company.  
Rivet Docks.  
Crane & Co.  
Safety Emery Wheel Company.  
Morton Mfg. Company.  
Geometric Drill Company.  
Potter & Johnston Company.  
W. F. & Jno. Barnes Company.  
Builders Iron Foundry.  
Westcott Chuck Company.  
Waterbury Tool Company.  
United States Metallic Packing Co.  
Grant Machine Tool Works.  
Gorton Machine Company.  
Goodell-Pratt Company.  
Oster Mfg. Company.  
American Machinery Company.  
Pearson Machine Company.  
Springfield Mfg. Company.  
Whitman & Barnes.  
Bradford Mill Company.  
American Turret Lathe Works.  
Trimont Mfg. Company.  
Onelda National Chuck Company.

Fosdick & Hollaway Machine Tool Co.  
Prentiss Vise Company.  
Hart Mfg. Company.  
Pratt Chuck Company.  
Vitrified Emery Wheel Company.  
Armstrong Brothers Tool Company.

#### HONORABLE MENTION.

F. A. Errington.  
Perkins Machine Company.  
Oesterlein Machine Company.  
D'Amour & Littledale.  
J. T. Slocumb & Co.  
Thos. R. Almond.  
Perry Ransom.  
W. H. Nicholson & Co.  
O. S. Walker & Co.  
G. T. Eames Company.  
Universal Machine Company.  
Leland-Faulconer Mfg. Company.  
Baldwin.  
James Clark.  
American Tool Works Company.

#### COLLABORATORS.

#### SILVER MEDAL.

A. D. Gates, E. C. Atkins Company.  
Fred. Holtz, Cincinnati Milling Machine Company.  
Oberlin Smith, Ferracute Machine Co.  
Fred. Rosback.  
James Hartness, Jones & Lamson Machine Company.  
Grosmann, Pratt & Whitney Company.  
Kansen, Pratt & Whitney Company.  
Walter M. Allen, Warner & Swasey.  
William E. Reed, Warner & Swasey.

#### BRONZE MEDAL.

Leslie H. Colburn, Baker Brothers.  
J. F. Lawner, Horton & Son Company.  
O. S. Rockwell, Horton & Son Company.  
G. W. Smith, Ingersoll Milling Machine Company.  
E. J. Leis, Ingersoll Milling Machine Company.  
H. G. Stoner, Landis Tool Company.  
C. B. Hershey, Landis Tool Company.  
Geo. M. Gebbsen, Norton Emery Wheel Company.  
Harrington, Pratt & Whitney Company.  
Coach, Pratt & Whitney Company.  
Geo. L. Sands, Simonds Mfg. Company.  
Harry G. Manning, Simonds Mfg. Co.  
E. A. Muller, Springfield Machine Tool Company.  
Edward Burns, Springfield Machine Tool Company.

## GROUP V.

### Class 23.—Mechanical Production and Utilization of Electricity.

#### GRAND PRIX.

Westinghouse Electric & Mfg. Company.

#### GOLD MEDAL.

Bullock Electric Mfg. Company.  
Lorain Steel Company.  
Western Electric Company.

#### SILVER MEDAL.

Crocker-Wheeler Electric Company.  
Jeffrey Mfg. Company.  
Eureka Tempered Copper Works.  
Shaw Electric Crane Company.

#### BRONZE MEDAL.

Vulcanized Fiber Company.  
Albert & J. M. Anderson.  
Belknap Motor Company.  
C. & C. Electric Company.  
Jenney Electric Mfg. Company.  
Milwaukee Electric Company.  
Stow Mfg. Company.  
Tresher Electric Company.  
Triumph Clock Electric Company.  
Lakon Transformer Company.  
Pittsburgh Transformer Company.  
R. Thomas & Sons Company.  
New York & Ohio Company.  
Standard Paint Company.

## HONORABLE MENTION.

Garten Daniels Company.  
Circular Iron Company.  
General Equipment Company.  
Chase Shawmut Company.  
Crown Woven Wire Brush Company.  
Crouse Hinds Electric Company.  
Holmes Fiber Graphite Company.

## Class 24.—Electro-Chemistry.

## GRAND PRIX.

E. C. Acheson.

## GOLD MEDAL.

Alvin Mfg. Company.

## COLLABORATORS.

## SILVER MEDAL.

Tone, J. G., Carborundum Company.  
Fitzgerald, Carborundum Company.

## Class 25.—Electric Lighting.

## GOLD MEDAL.

National Carbon Company.  
Tiffany Glass & Decorating Company.  
Ward, Leonard & Co.  
Western Electric Company.  
Helois, Upton & Co.

## SILVER MEDAL.

Holophane Glass Company.  
The Bristol Company.  
Hart & Hageman Mfg. Company.  
Iron Clad Resistance Company.  
New York & Ohio Company.  
Oxley & Enos Company.  
Pass & Seymour.  
United States Carbon Company.

## BRONZE MEDAL.

Almond, Thomas R.  
Chase Shawmut Company.  
Frink.  
American Electric Novelty.  
W. M. Inglis Wire & Iron Works.  
Ward, Leonard & Co.  
E. B. Meyrowitz.

## COLLABORATORS.

## GOLD MEDAL.

E. P. Werner, Western Electric Co.

## SILVER MEDAL.

Nash, Tiffany Glass & Decorating Co.  
Howard E. Watkins, Oxley & Enos.

## BRONZE MEDAL.

Will Saunders, Carbon Company.  
Miss Clara Driscoll, Tiffany Company.  
Henri Schmidt, Tiffany Company.

## Class 26.—Telegraphy and Telephoning.

## GRAND PRIX.

American Wire & Steel Company.  
Rowland Telegraph Company.  
Western Electric Company.  
J. A. Roebling's Sons Company.

## GOLD MEDAL.

Edison Phonograph Company.

## SILVER MEDAL.

American Wireless Telegraph Company.  
Herzog Telesme Company.

## BRONZE MEDAL.

Safety Insulated Wire & Cable Co.  
American Electric Telephone Company.  
Dicke Tool Company.  
Farr Telephone & Construction Supply Company.  
Foot, Pierson & Co.  
Patrick Carter & Wilkins.  
Sprague Electric Company.  
Standard Telephone & Electric Co.  
Strongberg Carlson Telephone Co.  
Telephone Mfg. Company.

## HONORABLE MENTION.

Klein & Son.  
Pennsylvania Electric Company.  
Viaduct Mfg. Company.  
Insulating Saddle.  
Staple Company.

## COLLABORATORS.

## GOLD MEDAL.

F. J. Newburg, J. A. Roebling's Sons Co.  
T. H. Penniman, Rowland Telegraph Co.  
Wiegand, Rowland Telegraph Company.  
Ch. Scribner, Western Electric Co.  
K. Hayes, Western Electric Company.  
W. Patterson, Western Electric Co.

## SILVER MEDAL.

MacBertie, Western Electric Company.

## BRONZE MEDAL.

Northrup, Rowland Telegraph Company.  
Ch. Metz, Rowland Telegraph Company.

## Class 27.—Different Applications of Electricity.

## GOLD MEDAL.

Western Electrical Instrument Co.  
Mica Insulator Company.

## SILVER MEDAL.

The Ritter Dental Mfg. Company.

## BRONZE MEDAL.

William Marshall.  
E. B. Meyrowitz.  
American Electric Heating Corporation.  
Sempire Clock Company.

## HONORABLE MENTION.

American Electrical Specialty Company.  
Eldridge Electric Mfg. Company.  
Gold Car Heating Company.  
American Electric Heater Company.  
Gordon Battery Company.  
Hadaway Electric Heating & Engineering Company.  
McCay Engineering Company.  
Abbott Electric & Mfg. Company.

## COLLABORATORS.

## HONORABLE MENTION.

George Hanchette American Electrical Specialty Company.  
Frederick Sage, American Electrical Specialty Company.

## The Boiling Scale Not Settled.

A five days' conference between committees of the Amalgamated Association, Republic Iron & Steel Company and American Steel Hoop Company was held in Detroit last week, closing on Saturday, but contrary to general expectations, no settlement of the puddling and bar scales was reached. When the two committees went into joint conference the Amalgamated committee proposed what is known as the Indianapolis scale, or a boiling rate of \$5.50 per ton on a 1.5-cent card. This is a minimum rate of \$5.50 per ton, when bars sell at 1.50 cents per pound or less. The manufacturers proposed to pay \$5.25 per ton on a 1.5-cent card, the same as was paid last year. This, however, was not minimum, on account of bars having been sold within the past 60 days at relatively lower prices, when present cards are considered, than they ever sold at before. For this reason the manufacturers asked that the card rate be scaled down to the minimum of 1.2 cents, with the price for boiling at \$4.50 per ton, thereby making a price that will take care of the business and allow them to operate their mills under a low selling price as well as under a medium or higher prices. They claim that at the scale offered by the workmen it would be impossible for the plants to run and meet the competition from the East and from the steel mills. After a long discussion the workmen modified this proposition, offering to make their scale \$5.25 on a 1.5-cent card rate. This was also rejected, because the rate was too high. On Thursday this proposition was modified to \$5 per ton on a 1.4-cent card rate. After further discussion the manufacturers submitted this modified proposition: One-cent card rate, \$4.50 boiling price; 1.1 cents, \$4.62½; 1.2 cents, \$4.75; 1.3 cents, \$4.87½; 1.4 cents, \$5. Balance of scale to be the same as last year.

This proposition gave to the workmen the same price at a 1-cent card rate as had been previously offered at a 1.2-cent card rate, being an advance of 25 cents per ton at 1.2-cent rate. The question was raised at what price would the workmen be paid for September and October if this proposition was accepted, in consequence of the mills being idle during one examination period. The manufacturers then proposed to pay on a 1.3-cent card rate, or \$4.87½ per ton, for boiling during September and October, and that the shipments during that period should

fix the price for the next two months. These propositions were rejected, but as a substitute the workmen offered last year's card rate and base price, with some modifications in the footnotes.

Both sides seemed to have exhausted all their efforts to arrive at a settlement and an adjournment was taken, subject to a call from either side. After adjournment the manufacturers held a consultation and in order to show that they were willing to go to the extreme limit in order to effect a settlement, they asked for a further conference at 2 p.m., at which time they made a proposition to pay \$5 per ton for boiling for the months of September and October, the average price received for shipments of bar iron for the same period to fix the price for the next two months, in accordance with their modified proposition, but this proposition was also rejected.

The workmen's committee made a further modification, insisting upon a card rate of 1.4 cents and a minimum base rate of \$5 per ton, with the footnotes as in last year's scale. It being evident that no settlement could be arrived at, an adjournment was taken with the same provision as stated above.

The scale offered by the manufacturers last week is a higher scale, according to the selling price of bars, than was ever offered to any conference committee of the Amalgamated Association. The scale as offered is fully 15 per cent. higher, at the lowest possible point at which it can go, than the scale of 1898 and 1899, which was made with the individual mills before they were taken over by the Republic Iron & Steel Company and American Steel Hoop Company.

On Monday, September 10, notices was sent out from the offices of the Amalgamated Association, in Pittsburgh, to some 20 puddling and bar mills in the Central West and South that have started within the past two months for a conditional agreement with their men that a minimum rate of \$5 a ton for puddling would prevail on and after Monday, September 10. This was the final proposition made by the workmen at the Detroit conference, and is the price that will rule for puddling when bar iron is selling at 1.4 cents a pound. While a settlement over the scale was not reached, it is probable that another conference will be held at a very early date, and some agreement made by which the idle mills may be started up.

After the Detroit conference, T. J. Shaffer of the Amalgamated Association went to Milwaukee and ar-



ranged a scale for the Milwaukee mills of the Federal Steel Company. It is also stated that the puddling mills of the Federal Steel Company, at Bay View, Wis., have arranged to start under practically the same terms proposed by the Amalgamated Association at the Detroit conference. For this reason it is believed that arrangements will be made very soon by which the mills of the Republic Iron & Steel Company and the American Steel Hoop Company will also be started. There is no desire on either the part of the manufacturers or workmen to have a strike, but, on the contrary, both will do all in their power to bring about a peaceable settlement of the scale.

(By Telegraph.)

PITTSBURGH, PA., September 12, 1900.—It is probable that within a few days the idle mills of the American Steel Hoop Company will be started up, under the same scale as is now being paid at the Bay View mills of the Federal Steel Company. This scale goes down to 1 cent base for finishing mills. The American Steel Hoop Company insist that they be allowed the benefit of this scale, which is the same scale the manufacturers offered at the Detroit conference, and which the men refused to accept. The fact that President Shaffer of the Amalgamated Association went directly from Detroit to Bay View and allowed the men to start work under this scale is causing considerable adverse comment.

## The Colorado Fuel & Iron Company.

The elaborate pamphlet report of the Colorado Fuel & Iron Company has just been issued, and serves as an admirable example of completeness of information to stockholders of industrial concerns. J. C. Osgood, the president, presents the following report for the year ending June 30, 1900:

### Earnings.

The net earnings from operating departments carried to the credit of income account were \$2,349,681.62, an increase of \$1,291,589.62 over the preceding year. The net earnings of the fuel department show an increase of \$149,675.94 and the iron department an increase of \$1,182,855.45. In the fuel department the production of coal increased 212,569 tons and of coke 46,858 tons. The total net earnings from all sources amounted to \$2,394,676.27, which provided for all fixed charges, sinking funds, &c., leaving a balance of \$1,522,494.56, which was carried to the credit of profit and loss. The balance to credit of profit and loss account is \$1,525,344.55, representing accrued and undivided profits at the close of the current business year.

### Sinking Funds.

The application of net earnings to sinking funds has been on the usual basis as regards assumed depreciation on account of coal and iron ore mined, and an arbitrary amount of \$150,000 has been set aside to provide for the depreciation in value of the steel works plant. The total amount of net earnings set aside as sinking funds for depreciation of property is \$301,598.27 and an additional amount of \$64,444.29 (being 2 cents per ton on all coal and ore mined) has been set aside as an emergency fund.

### The Colorado Coal & Iron Company Bonds.

These bonds, to the amount of \$2,766,000, matured February 1, 1900, and with the aid of an Underwriting Syndicate were extended for two years, maturing February 1, 1902.

At the same time an option was given to the Underwriting Syndicate to purchase an equal amount of the Colorado Fuel & Iron Company 5 per cent. bonds, the proceeds to be used in paying off the extended Colorado Coal & Iron Company bonds at maturity. It is probable that this option will be exercised.

### Preferred Stock Dividends.

Dividends Nos. 7 and 8 for the year ending June 30, 1896, 8 per cent., \$160,000, were paid February 15, 1900. Dividends Nos. 9 and 10 for the year ending June 30, 1897, 8 per cent., \$160,000, were paid April 2, 1900. Dividends Nos. 11 and 12 for the year ending June 30, 1898, 8 per cent., \$160,000, have been declared payable September 5, 1900. This will leave accumulated dividends on the preferred stock for the years ending June 30, 1899, and June 30, 1900, a total of 16 per cent., or \$320,000.

It is probable that these remaining preferred stock dividends can be paid off in the near future.

### Increase of Capital Stock.

Attention was called in the last annual report to the necessity for increase in the capital stock of the company. A circular setting forth in detail the necessity for

this increase was issued to the stockholders September 5, 1899. A special meeting of the stockholders was held September 25, 1899, at which meeting the articles of incorporation of the company were amended, authorizing the increase of the capital stock of the company to \$25,000,000, the increase consisting of 120,000 shares of common stock, par value \$100 each, a total of \$12,000,000. This amendment was adopted by a vote of 98,557 shares of the 130,000 shares outstanding. The stockholders at this meeting also authorized the Board of Directors from time to time to issue the \$12,000,000 of common stock for cash or in payment for property, or in payment for improvements or developments. In accordance with this authority the Board of Directors entered into a contract for the sale of 60,000 shares of the common stock, par value \$6,000,000; the consideration for the sale of such stock being an agreement to build certain proposed improvements at the mines and steel works of the company and to make certain cash payments.

As stated in the circular issued to the stockholders under date of September 5, 1899, the whole of the new common stock would be required to carry out the improvements proposed. Conditions were such that the contract for the first 60,000 shares of stock was made on terms very favorable to the company, but under existing conditions it has not been possible to make a favorable contract, payable in stock, for the remaining improvements which have been planned.

In order to secure the full benefit from the improvements already under way it will be necessary to continue, and as fast as practicable carry out, all of the improvements originally contemplated. For this reason it has been deemed advisable to conserve the company's cash resources, and not to distribute all of the current year's earnings in dividends to the preferred and common stockholders until arrangements can be made for disposing of the remaining authorized common stock of the company.

The balance to the credit of profit and loss account at the close of the business year, \$1,525,344.55, is sufficient to pay the accumulated dividends on preferred stock and 6 per cent. on the outstanding \$17,000,000 of common stock, and this surplus will be available for dividend purposes when stock can be sold to complete the steel works and other improvements which have been undertaken.

### Outlook.

From the present outlook the net earnings for the six months ending December 31, 1900, will probably show a considerable increase over the earnings for the same period last year, notwithstanding the reduction in the selling prices of iron and steel products. During the remaining six months of the coming year the company will have a largely increased output of iron and steel, which will help materially in maintaining the earnings, if prices of iron and steel continue to decline, a condition which, considering the prosperity of the country and large demand for iron and steel, is not likely to exist.

In accordance with previous custom the accounts for the year have been audited by Stephen Little, whose certificate accompanies this report.

The following is a statement of earnings and expenses of the last two years:

	1899-1900.	1898-1899.	Increase.
Gross earnings.			
Fuel department.....	\$5,106,302.47	\$4,627,908.89	\$477,393.58
Iron department.....	4,928,650.86	3,237,108.75	1,691,542.11
Denver retail department.	266,042.19	255,947.66	10,094.53
Pueblo retail department.	44,976.21	41,505.29	3,470.92
Miscellaneous .....	5,057.81	2,338.59	2,719.22
Totals, gross earnings.	\$10,350,029.54	\$8,164,809.18	\$2,185,220.36
Operating expenses.			
Fuel department.....	\$3,967,606.59	\$3,639,888.95	\$327,717.64
Iron department.....	3,540,805.37	3,032,118.71	508,686.66
Denver retail department.	246,865.28	239,823.56	7,041.72
Pueblo retail department.	43,166.06	39,926.88	3,239.18
Totals, operat. exp'ses.	\$7,798,443.30	\$6,951,758.10	\$846,685.20
Net earnings.			
Fuel department.....	\$1,137,695.88	\$988,019.94	\$149,675.94
Iron department.....	1,387,845.49	204,990.04	1,182,855.45
Denver retail department.	19,176.91	16,124.10	3,052.81
Pueblo retail department.	1,810.15	1,578.41	231.74
Miscellaneous .....	5,057.81	2,338.59	2,719.22
Totals, net earnings...	\$2,551,586.24	\$1,213,051.08	\$1,338,535.16
Less management.....	201,904.62	154,959.08	46,945.54
Balance carried to income account .....	\$2,349,681.62	\$1,058,092.00	\$1,291,589.62

It will be observed that it was the iron department which was largely responsible for the great gain of the last fiscal year.

The Snow Steam Pump Company of Buffalo, N. Y., bid \$350,000 for two pumps for the Brilliant Pumping Station in Pittsburgh, while the Camden Iron Company of Camden, N. J., bid \$272,000 on the same work. Both bids were considered too high, and it is likely neither will be accepted.

# HARDWARE.

## Condition of Trade.

**O**RDERS for goods have shown a slight falling off in number during the past few days, but not enough to have much effect upon business. Buying in small quantities frequently is still the practice of merchants. In view of an unsettled market and other features of the situation which at present affect business unfavorably, the trade conditions which prevail are looked upon as fairly satisfactory. Manufacturers in a few lines of heavy goods report that jobbers have concluded that the bottom has about been reached, and are coming into the market. The placing of contract orders is not supposed to characterize the trade to any great extent.

### Chicago.

(By Telegraph.)

Shelf Hardware of all kinds is moving in seasonable quantities for quick needs. But the orders for fall goods are not coming in with the usual ease. Some of the goods bought last spring for fall delivery, before the disposition to withhold orders became so marked, are now being asked for, but new transactions of the kind are few. The approach of cold weather is regarded by the trade as essential to a brisk demand, and some sellers are preparing to respond to a very active call within a narrow limit of time, for it is believed that when Stove Boards, Elbows, Coal Hods and similar goods are wanted they will be wanted very quickly. Among the goods that are selling freely are Hammers, Hatchets and like Tools. The trade in Builders' Hardware is fair, but comes mainly in small mail orders, and from all directions. The city trade is comparatively unimportant. A feature of the Heavy Hardware trade is the large number of rush orders, many of them by wire, calling for immediate shipment. The goods are wanted in this way among almost all classes of manufacturers. Wire orders have been even followed up by personal visitations in some instances, to hasten dispatch, if possible.

### St. Louis.

The week again opened encouragingly and brought a generous number of orders to the jobbing trade. Not the least interesting evidence of the generally prosperous condition of merchants was seen in the very satisfactory remittances covering past purchases. It is true the individual orders are not for heavy amounts, but jobbers hear more frequently from their customers than they did a year ago and, taken in the long run, the volume of purchases compares favorably with 1899. No particular items can be commented on; assembling floors show a wide range of articles in demand. Quick shipments are urged by buyers, and especially does this apply to Wire, Smooth and Barbed, and Wire Nails. Stocks of all kinds in dealers' hands seem to be below the normal point, and while little disposition exists to make speculative purchases every effort is made to satisfy consumers by ordering promptly and hastening shipments. Buying of Stoves, Ranges, Air Tight Heaters and related small supplies is perhaps more brisk than a month past. For the period activity is quite pronounced in Stamped and Pieced Tinware. Sales for August seem generally to have been greater than in the same month of last year, and September wants are figuring up in favorable comparison. Results of delayed buying are in evidence and makers say it is difficult to satisfy all customers in matters of delivery. Black Sheets in small

lots are moving quite encouragingly. The Heavy Hardware trade report a good demand for all lines, and make no complaint as to volume of business.

### Boston.

**BIGELOW & DOWSE COMPANY.**—The month of August closed with trade somewhat improved over that of July and with a decidedly better feeling prevailing regarding values, for while a few articles have still more or less of a weakness, the market as a whole is obtaining a steadiness which inspires confidence.

Reports from a number of representative retailers in the State show quite a satisfactory business, and while buying continues to be characterized by conservative action, all indications point to a satisfactory and healthy fall trade. The extremely warm weather we hope will soon be a thing of the past, and with the advent of cooler weather we shall at least have one less antagonist to contend with in the irrepressible conflict for business.

Collections continue to be fairly good, although the usual calls on the pocketbook for vacation purposes will hardly have ceased their demands.

Summing up the situation, unless some radical changes precipitate present values, we predict good business for the balance of the year.

## Notes on Prices.

**Wire Nails.**—The demand for Wire Nails is exceeding the production of the largest manufacturers. For some time jobbers have anticipated their requirements at least two weeks, to insure receiving Nails in time to keep their stocks replenished. The demand from the retail trade continues for small lots and hurried shipments. Prices are without change, as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots.....	\$2.20
To jobbers in less than carload lots.....	2.25
To retailers in carload lots.....	2.30
To retailers in less than carload lots.....	2.40

**New York.**—Nearby dealers are using the telephone freely in ordering small lots of Wire Nails from store. Accompanying orders are requests for shipment the same day. The volume of business continues about the same. Quotations are as follows:

To retailers, carloads on dock.....	\$2.48
Small lots from store.....	\$2.55 to \$2.60

**Chicago, by Telegraph.**—The *per diem* sales of Wire Nails for September to date are reported to have been in excess of those for any previous month this year, and an increase in the production is said to be probable in the near future. Texas is calling loudly for Nails, and also the entire West, in moderate, but numerous orders. A threatened weakness seems to have passed by, and there are intimations that current prices will be maintained through the fall trade. Carload lots are quoted at \$2.35, and small lots \$2.40, from store.

**St. Louis.**—Stocks of Wire Nails in the hands of the trade are said to be quite light. Orders to mills are invariably accompanied by requests for prompt deliveries. The volume of business is quite good, but delay is anticipated in shipments from mills, attributed to car shortage, owing to the heavy movement of grain. Price to retailers in carloads is \$2.45, base; for smaller lots \$2.55, base.

**Pittsburgh.**—When it is considered that this is usually the duldest season of the year in Wire Nails, the demand at this time can be referred to as very satisfactory. A good many more Nails are moving than for some time, and the character of the orders, many of which are sent



in by telegraph, indicates clearly that stocks of Nails in the hands of jobbers and retailers are very light. Additional mills of the leading interest, which have been idle for some time, are being started up. There has been no change in prices, and we quote as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots.....	\$2.20
To jobbers in less than carload lots.....	2.25
To retailers in carload lots.....	2.30
To retailers in less than carload lots.....	2.40

**Cut Nails.**—The reaffirming of Cut Nail prices by manufacturers has not increased the demand. Prompt shipment of small lots represents the condition of the market. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, 2 per cent. off in 10 days:

Carload lots .....	\$1.95
To jobbers in less than carload lots.....	2.00
To retailers in less than carload lots.....	2.10

**New York.**—The demand for Cut Nails in the local market is limited to small lots. There are slight irregularities in the price of small lots of Nails from store, but quoted carload prices are generally maintained. Quotations are as follows:

To jobbers in carload lots on dock.....	\$2.15
To jobbers in less than carload lots on dock.....	2.18
To retailers in less than carload lots on dock.....	2.31
Small lots from store.....	\$2.25 to 2.30

**Chicago, by Telegraph.**—Prices of Cut Nails are firm at previous quotation, \$2.25 for small quantities from store, with fair trade.

**St. Louis.**—No unusual demand is reported in Cut Nails. Prices remain unchanged at \$2.30, base, out of stock.

**Pittsburgh.**—There is a fair movement in Cut Nails, and it is claimed that established prices are being more firmly held than for some time. A determined effort is being made by Cut Nail manufacturers to stop cutting of prices. We quote f.o.b. Pittsburgh, terms 60 days, 2 per cent. off in 10 days, as follows:

Carload lots .....	\$1.95
To jobbers in less than carload lots.....	2.00
To retailers in less than carload lots.....	2.10

**Barb Wire.**—The domestic demand for Barb Wire is light, and the majority of orders are for small lots. Quotations for domestic trade are as follows, f.o.b. Pittsburgh, net cash 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots, Painted.....	\$2.50
To jobbers in carload lots, Galvanized.....	2.80
To jobbers in less than carload lots, Painted.....	2.55
To jobbers in less than carload lots, Galvanized....	2.85
To retailers in carload lots, Painted.....	2.60
To retailers in carload lots, Galvanized.....	2.90
To retailers in less than carload lots, Painted.....	2.70
To retailers in less than carload lots, Galvanized....	3.00

Ellwood and Baker Wire is 5 cents and Washburn & Moen Glidden 10 cents per 100 higher than the foregoing prices.

**Chicago, by Telegraph.**—Trade in Barb Wire may be slightly less active than in Nails, but the volume is seasonably good and orders indicate that stocks throughout the country are small. Irregularities in prices are disappearing and the market has a firmer tone. Small lots, Chicago delivery, are quoted \$2.35 for Plain Annealed, \$2.70 for Painted Barb, and \$3 for Galvanized Barb Wire.

**St. Louis.**—Trade in Barb Wire is somewhat better this week and may be expected to show improvement as farmers' operations in the field draw to a close. Painted in carloads is \$2.75; smaller quantities, \$2.85. Galvanized commands 30 cents advance on these prices.

**Pittsburgh.**—Demand for Barb Wire continues light and for small lots only. For domestic trade we quote as follows: Galvanized Barb Wire, \$2.80, in carload lots to jobbers, and Painted at \$2.50. Terms, 60 days net, with 2 per cent. discount for cash in 10 days, f.o.b. Pittsburgh.

**Plain Wire.**—The demand for Plain Wire shows a slight improvement, but orders continue for small lots.

Prices are being shaded to some extent by independent mills. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days:

	Base sizes.	Plain.	Galv.
To jobbers in carload lots.....	\$2.15	\$2.55	
To jobbers in less than carload lots.....	2.20	2.60	
To retailers in carload lots.....	2.25	2.65	
To retailers in less than carload lots.....	2.35	2.75	

The above prices are for the base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the advances indicated in the following table:

Plain Fence Wire Advances (Catch Weights).			
Nos.	Base	Galvanized.	
6 to 9.....	\$0.05 advance over base.....	\$0.40 extra.	
10.....	.10 " " " ".....	.40 "	
11.....	.15 " " " ".....	.40 "	
12 and 12½.....	.25 " " " ".....	.40 "	
13.....	.35 " " " ".....	.40 "	
14.....	.45 " " " ".....	.75 "	
15.....	.55 " " " ".....	.75 "	
16.....	.70 " " " ".....	1.00 "	
17.....	.85 " " " ".....	1.00 "	

For even weight bundles, 50 pounds and over, 5 cents per bundle advance on above.

**Pittsburgh.**—The demand for Plain Wire is very fair in view of the season, and seems to be improving. Buyers continue to place orders mostly for small lots, but as most of these are for prompt shipment, it is certain that stocks of Wire are very light all over the country. A vigorous fall trade is expected. We quote:

	Plain.
To jobbers in carload lots.....	\$2.15
To jobbers in less than carload lots.....	2.20
To retailers in carload lots.....	2.25
To retailers in less than carload lots.....	2.35

Galvanized Wire up to No. 14 is 40 cents advance on Plain, Nos. 15 and 16, 75 cents advance, and Nos. 17 and 18, \$1 advance. Terms are 60 days net, with 2 per cent. discount allowed for cash if paid in 10 days from date of invoice.

**Steel Goods.**—The associated manufacturers of Farm and Garden Tools, under date of September 1, announce that for the coming season, list prices and base discounts of regular Steel Goods remain unchanged, except the base discounts on the following goods, which are new, as follows:

Header Forks, 4 tine, 13 to 16 inches.....	.66 2-3 %
Grain or Barley Forks, 4 and 5 tine, 16 to 20 inches.	70 and 6 %

These prices are designed for the retail trade, with an additional rebate to the jobbing trade.

**Scythes.**—The associated manufacturers of Scythes, at a meeting held on September 7, fixed the prices of Scythes for the season of 1900-1901. They are the same as were in force previous to January, 1900. Prices were advanced, it will be remembered, 25 cents per dozen at that time, so that present prices are practically a reduction in price of 25 cents a dozen. The differences in price between the three classes of buyers, as per the A, B and C lists, remain the same, as do also the terms of payment and delivery. Jobbers did not buy liberally during the season past, owing partly to the fact that a good many Scythes were carried over, and because the trade regarded prices established by the combination as too high. The belief is expressed that jobbers will go into the market practically bare of stocks.

**Ammunition.**—The market on loaded Shot Gun and Metallic Ammunition, since the beginning of September has changed materially, a great deal of business being now in sight. Orders given for future shipments are being urged forward now. The manufacturers of this class of goods state that they will have all they can do this fall, judging by the orders in hand, the opening of the fall shooting season having developed a better business in this line than has been known this year.

**Sash Weights.**—The Sash Weight market is experiencing a moderate volume of business. There is considerable difference in the quotations of manufacturers. In the East the market is represented by a quotation of \$22

to \$25 per ton for carload lots. In less than carloads the price is from \$1 to \$2 more. Prices in the West are relatively lower than in the East, and are represented generally by \$18 for carload lots; but some manufacturers are making lower quotations, and \$16 to \$16.50 is obtainable.

**Fuse.**—Manufacturers of Fuse have issued revised list prices of Fuse. These are as follows, and are subject to a discount of 10 and 7½ per cent. at factory:

	Per 1000 feet.
Hemp Fuse.....	\$2.60
Cotton Fuse.....	2.90
Single Taped Fuse.....	3.25
Double Taped Fuse.....	4.20
Triple Taped Fuse.....	5.00

**Shovels and Spades.**—The associated Spade and Shovel manufacturers are now holding their regular quarterly meeting in this city. It has been intimated that a change in prices might be made, but as we go to press nothing definite has been determined.

**Augers and Bits.**—A meeting of the manufacturers of Augers and Bits was held in this city to-day, at which all the makers of these goods were represented. Present prices were reaffirmed and will be strictly maintained.

**Cordage.**—A considerable quantity of mixed Rope is being offered, and this, with the prospect of declines in Hemp, has caused irregularities in prices. The introduction of other fibers than Sisal and Manila Hemp does not make Rope worthless for some purposes, while for others it is a great detriment to its usefulness. Variations in price are more pronounced in Manila Rope than in Sisal. Manufacturers' quotations for the best quality of Manila Rope, on the basis of 7-16 inch and larger, vary from 10¼ to 10½ cents per pound. Sisal Rope is quoted at 6¼ to 6½ cents on the same basis. For inferior grades quotations of 9 to 9½ cents for Manila and 6 cents for Sisal Rope are reported.

**Glass.**—During the week ending September 8 most of the American Window Glass Company's factories resumed work, but are not manned to their full capacity. A few of the independent and some of the co-operative factories have also started. Considerable Glass is being blown, but with the limited number of flatteners and cutters at work it is difficult to say how soon new glass will reach the market. The American Company announce that no change in prices will be made until all labor troubles are settled. Jobbers are awaiting action by the manufacturers before deciding on discounts for their new list.

**Paints and Colors.**—**Leads.**—The advance in the price of Lead products noticed in these columns last week had somewhat of a stimulating effect upon trade. Small buyers placed orders more liberally when they recognized the strength of the market. Quotations are as follows: In lots of 500 pounds and over, 6¼ cents; in lots of less than 500 pounds, 6½ cents per pound.

**Oils.**—**Linseed Oil.**—The demand for Linseed Oil is confined almost entirely to small lots for immediate delivery. Crushers are not quoting prices which carload buyers are willing to pay. Spot demand has improved, and while there is no quotable change in prices, City Raw has been sold in lots of five barrels or more at 65 cents per gallon. In some instances State and Western brands are being sold at 63 cents in lots of five barrels or more, and are quoted at 62 cents in carload lots. Regular quotations are as follows: City Crushed Raw Oil 67 cents in lots of five barrels or more, and at 68 cents in lots of less than five barrels. State and Western brands, 63 cents in lots of five barrels or more. Boiled Oil is sold at an advance of 2 cents per gallon on Raw.

**Spirits Turpentine.**—Conditions in the Turpentine market have improved during the week under review, and prices have made a sharp advance. The change has been caused by an active export demand at Southern points and a decrease in local receipts. The New York market is firm at 39 cents for Southern, and 39½ cents

for machine made barrels, with higher prices anticipated.

## Letters from the Trade.

*Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.*

### Warranting Edge Tools.

A communication received from an Illinois Hardware merchant relates to the unsatisfactory results of guaranteeing Edge Tools. He would be pleased to learn from manufacturers and dealers as to the extent to which guarantees are generally given on this class of goods. The letter is as follows:

I had a number of Half Hatchets returned from men working in the car shops. They claim the Hatchets break at the eye, usually in driving nails. I cannot understand how that is possible, especially as the Hatchets are rather heavy at the point where they break.

Have any other dealers had the same experience and what guarantee do they extend on tools generally, as so many questions arise where the warrant is apparently abused? Would like to get the opinion of both dealers and manufacturers on the guarantee of same, or where they would place the limit.

### English vs. American Methods.

A Canadian correspondent writes as follows in regard to a recent experience with English manufacturers and contrasting it with the method followed by American manufacturers under similar conditions:

I was amused at some remarks from your Australian correspondent in a late issue with reference to the manner of doing business of some of your American manufacturers and a comparison with English manufacturers. I have had some experience lately of the two countries and as far as I have gone, it is decidedly in favor of the American houses.

At the time the preferential tariff went into force in favor of English goods, there were several trade journals here who thought it a good opportunity for English manufacturers to advertise their wares, and with a laudable eye to furthering the interests of the said manufacturers and doing themselves a good turn at the same time, they sent over representatives to try and secure a few advertising contracts.

Now, as I imagined that those from whom they secured contracts were anxious to cultivate this market, I wrote to many of them, giving as a reference the best houses in this country and asking them at least to open correspondence with a view to seeing what could be done, or if we could get on common ground on which we could do business that would be mutually advantageous. It is hardly credible, but out of 50 or 60 letters I only received answers to five or six, and in several of these the replies were such as to indicate that the manufacturers were under the impression that they would be able to get almost any price they liked to ask, totally ignoring the fact that we had an energetic nation at our very doors that was able and anxious to handle all the business we could give them at one price, and that the best, and to give us moreover much quicker shipments than English houses are noted for. I say this to my shame, for I am an Englishman by birth.

On the other hand, American houses that I have written to have invariably had the business courtesy to answer my letters whether they could do business with me or not, and if they could do business there was no beating about the bush. A short business letter, giving discounts and a request for orders, was all that was necessary, and, as a rule, I find their prices are pretty



nearly right, without a whole volume of correspondence to make them so.

### Thomas H. B. Davis.

**T**HOMAS H. B. DAVIS, a traveling salesman well known to the Western trade, died on the 4th inst. at Sandusky, Ohio, of apoplexy. Mr. Davis began visiting the trade about 1864 in the interest of the Meriden Britannia Company, but a year or two later engaged with the Middletown Plate Company, of which he was subsequently elected vice-president. Mr. Davis traveled for this company and their successors, the International Silver Company, until the time of his death. He made his headquarters in the West and traveled that field exclusively. The following tribute to his memory comes from Wm. H. Maher of Toledo, Ohio, where Mr. Davis resided for many years:

It was with a keen pang of sorrow that I read in my evening paper of yesterday the brief item telling of the death of that genial friend, Thomas Davis.

My mind ran back to the day, 35 years ago, when I first took him by the hand, and I liked him from that moment. It is not many weeks since we sat together and chatted about mutual friends and the changes going on about us in trade circles.

Thirty-five years is a long time to the young to look forward to, but it seems a very brief period when one looks back over it. Davis was then representing the Meriden Britannia Company, and his visit to us was regarding that now almost extinct item of the Hardware line, Britannia Spoons.

I don't know how soon after that it was that he became a member of another concern, which from that time on he has represented on the road.

All that any of us can possibly leave behind us is the memory that our friends have of us, and in this Davis left a rich legacy. One word expresses him fully and completely—he was genial in an unusual degree. His manner was heartiness itself, and his salutation had none of the element of "trade" in it, but was personal and pointed, leaving no doubt of his pleasure at meeting one again.

The announcement says he was 60 years of age, but I find it hard to realize this. The new concerns upon whom he called may have looked upon him as an elderly man, but we, who grew old along with him, have never thought of him as anything but young. And, indeed, he was young in spirit, and it is this, and not years, that gauges a man's age.

Davis has gone from among us with his bustling energy, his keen trade instinct and widely gained knowledge, with his kindly heart and voice, but he has left many friends behind him who would gladly drop a flower on his grave and whisper, "Good-by, till we meet again."

THE COLUMBIA MFG. COMPANY, Niles, Ohio, and Chas. W. Morgan, Jamestown, N. Y., have consolidated their interests under the style of the Columbia-Morgan Handle Bar Company. The officers of the new concern are Charles W. Morgan, president; E. C. Brainard, vice-president, and W. H. Foster, secretary and treasurer. These officers, with Myron I. Arms, Youngstown, Ohio, and C. H. Kilburn, Jamestown, N. Y., constitute the board of directors. The manufacture of the Morgan Bars will be continued, and a new line of Seat Posts added.

The Sequin Hardware Company, Sequin, Tex., have been incorporated with a capital stock of \$20,000, paid in. C. E. Tips is president of the company, J. H. Bond, Jr., vice-president, and F. L. Heilig, manager. Mr. Tips is also president of the First National Bank of Sequin. Mr. Bonds travels for W. B. Belknap & Co. of Louisville, is president of Bryant & Bond Company of Cameron, Texas, and vice-president of C. H. Dean Company of San Antonio. Mr. Heilig until recently was in business in San Antonio. The company will handle full lines of Hardware and furniture.

The Garver Hardware Company, incorporated, have succeeded J. A. Garver in the wholesale and retail business at Des Moines, Iowa, Mr. Garver collecting and retaining the old accounts and having an interest in the new concern. The company have doubled the capacity of storeroom and have added to the former stock (Shelf and Builders' Hardware) Stoves, Tinware, Woodenware and other House Furnishing Goods. Their present building is 44 x 132 feet, three stories and basement. The business was established 20 years ago.

## Phenomenal Hardware Concerns.

BY VIATOR.

**T**HE Hardware houses who have assumed phenomenal proportions within three decades in the United States and have distanced all comers in all countries of the globe, are those whose guiding spirit is a commander-in-chief, whose executive, organizing genius prompts him to select captains who are masters of the department of the business which they have been commissioned to command.

### Hardware and Army Chiefs Compared.

As a general commanding an army simply issues general orders and indicates the end to which he is striving, without giving orders about minute details which may develop in action, so the chief of a modern Hardware house confines himself to general instructions to his captains. A captain best fitted for a certain department is given full charge thereof. An appropriation is made, within the limits of which he is to operate, and he is ordered "to make money."

### Characteristics of a Department Chief.

If this captain be a buyer of a certain line of goods he makes a close study of the minutest details as to their quality, value, styles, &c. He is expected to know the manufacturers whose facilities enable them to give the best values as to quality, styles, &c. A captain in command of such a department can, by close application to his task in buying attractive patterns at reasonable prices, make a better showing with a given number of dollars than if this captain undertook to buy all lines of goods within the scope of a modern Hardware concern. This captain may be a pronounced success and "money maker" in the Builders' Hardware department, but his lack of knowledge of Guns and other lines and the mistakes he may make in these, may blast all the earnings from the lines with which he is familiar.

### Satisfactory Results the Test of Ability.

The general-in-chief of the day strives to find experts in the various branches, and encourages and inspires them onward, forward. When these are found confidence is imposed in them, and they are not constantly hampered by their chief in the execution of the plans to attain the highest results.

### Distributing Responsibility.

Such a buyer, after inaugurating a system best adapted to his particular department, allows his corporals and privates to do the detail work, and thus finds ample time for reflection and aggressive campaigning. He finds time to courteously receive the manufacturer or his representative, from whom he can invariably obtain valuable information as to the drift of the market and the contemplated changes of designs and other departures.

### A Hint to Buyers.

By giving a manufacturer a prompt audience, with ample time and comfort to transact the business in hand, the chances are that many a time an "inside" or "confidential" discount may be obtained. In case of delays or "call again to-morrow" or "too busy to see you," this "inside" is often converted into an additional "just to compensate the seller" for the loss of time and wear and tear of mind.

### Pen Picture of a Hardware King.

The "chiefs" of our phenomenal and towering Hardware successes who have astonished the world have the intricate machinery of the business so organized in all its branches, such as purchasing, shipping, banking, bookkeeping, insurance, &c., that a report, 8 x 4 inches, placed on their desks at a certain hour of the day gives them the general movements of their armies and a synopsis of the approximate stock on hand, approximate earnings, receipts, condition of bank account, expenditures, &c., for a given day.

Said a Hardware king to the writer, who had been a thousand miles from his business:

"Here is the condition of our business on March 14," showing me a sheet of paper of the above dimensions. These daily reports in well regulated concerns are tabulated by the general, who can make comparisons with previous years for like periods and thus detect the shortcomings of his captains, and call them to account and urge them on to greater efforts. Very often these comparisons show exceptional merit of a captain. In such a case a "decoration" of an increased salary may be ordered by the general.

#### How the Growth Has Been Accomplished.

The United States can boast of more and larger well organized Hardware houses than any other country in the world. One of our jobbers has grown in about one-quarter of a century from a business less than a million to nearly the \$20,000,000 per annum mark, but I venture to say that its guiding spirit could not, without reference, give the correct cost of a dozen articles in his concern, nor their selling price.

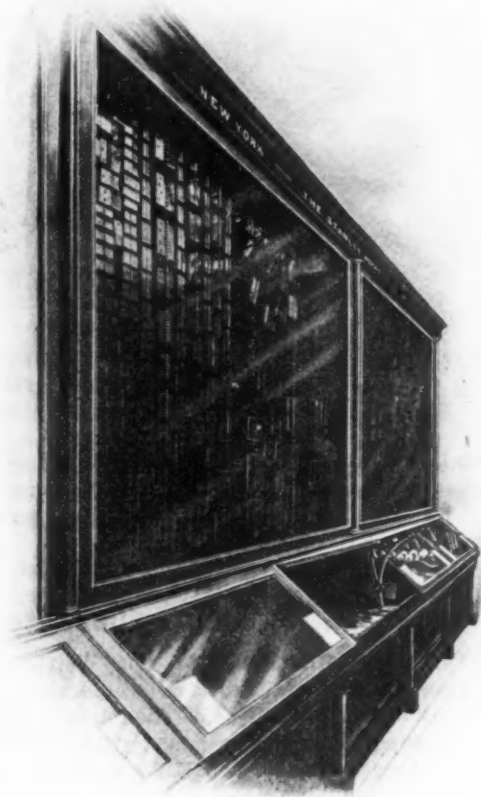
All this has been accomplished with a limited but ample capital in the beginning by superior generalship, energy, exceptional integrity and fair dealing with all and generous treatment of employees, a total absence of social features, such as drinking, smoking, story telling, &c.—in short, business, simply business.

The phenomenal houses referred to are for the most part in operation north of the Ohio River. With a few exceptions, sociability still reigns south with a tinge of "to-morrow."

## Hardware Exhibits at Paris.—II.

### The Stanley Works,

New Britain, Conn., occupy four cases in the display of their products. The first two cases are filled with Butts

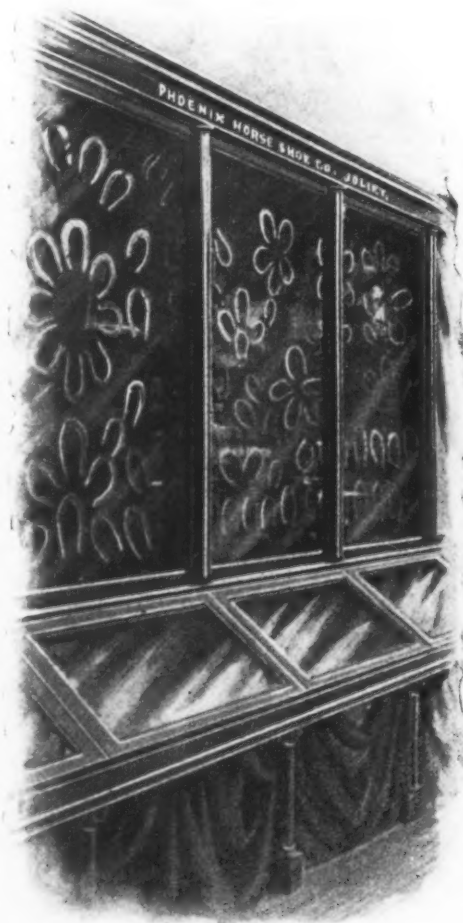


and Hinges, the different varieties of which are shown in profusion and in all styles of finish. Loose pin and loose joint Butts are shown, as well as Butts with plain and ball bearing washers, both plain and ornamental, Broad and Narrow Butts, Shutter and Blind Butts, Par-

liament Butts, &c. All of these articles are of wrought steel and made in the well known Stanley style. The other boards are used for the display of other classes of goods, like Strap Hinges of all sizes and descriptions, and all the varieties of Bolts, flush, spring, barrel, square, round neck, square neck, tower, shutter, &c. The collection also includes a line of Wrought Steel Shelf Brackets. The display gives a good idea of the character and variety of the products of this concern.

### The Phoenix Horse Shoe Company,

Poughkeepsie, N. Y., and Joliet, Ill., occupy three cases. In the central case the Horse and Mule Shoes exhibited are such as furnished to the trade, while in the others the Shoes have been nickel plated. The complete series is



shown from a light Shoe weighing 8 ounces to a heavy one tipping the beam at 3 pounds 8 ounces. There are country and city Shoes, Snow and Prairie Shoes, as well as Mule Shoes of different sizes. The designs on the boards give an idea of the extensive variety of Shoes manufactured by the company.

### Bommer Brothers,

Brooklyn, N. Y., exhibit a full line of their well-known Spring Hinges, occupying two cases. This firm have taken an extension which seems out of proportion with the manufacture of the single article to which they devote their energies. An examination of the goods on view goes far toward explaining this. Every detail pertaining to the building of a Spring Hinge has been studied with the same care as if it was an instrument of precision. Cold rolled steel forms the body of the Hinge. The bearings are turned out of solid steel rods. The springs are harder where the strains are greater. When bronze is used all wearing surfaces are made of steel, and the workmanship and finish are of high grade. One of the boards is devoted to Steel Hinges of various kinds of finish, while the other contains Bronze Hinges and

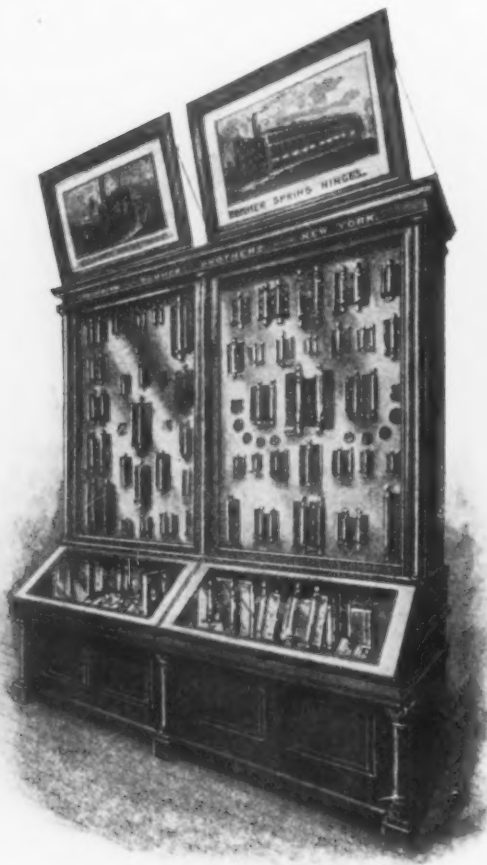


others which have been bronzed, brassed or nickered. The flat cases below contain Hinges and detached parts of the same, showing the construction in detail.

#### Fayette R. Plumb,

Incorporated, Philadelphia, Pa., have a fine oak case, the space covered being 3 feet 8 inches in width and 15 feet 6 inches in length. This case has plate glass panels all around and is surmounted at each end with cathedral glass cupolas which complete the structure and add to the general effect from an architectural standpoint. A rectangular pyramid covered with black velvet has been placed in the inside and the four sides have been used for the display of the company's goods. On one of the long sides, Hammers of all kinds are shown, while on the other Axes and Hatchets are shown in great variety. One of the narrow ends is used for Butchers' Tools, and the other for Picks and Track Tools. The general effect is very striking on account of the highly finished state

of the tools displayed. Every article is either nickel plated or nicely blued, but this is not done for exhibition purposes. It will easily be understood that with such materials at hand pleasing designs could easily be made. Even the blood-curdling Beef Splitters look pleasant on their black velvet cushion. Gigantic Hammers of various kinds form the center of the designs.



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#### J. H. Williams & Co.,

9 to 31 Richards street, Brooklyn, N. Y., makers of Drop Forged Specialties and Special Drop Forgings, occupy a space 32 feet in length. They exhibit Vulcan Chain Pipe Wrenches, over 300 different sizes and styles of Drop Forged Engineers' Wrenches, besides Lathe Dogs (bent and straight tail patterns), Gas Engine Valves and Crank Shafts, a number of specialties for machine tool builders, such as Tool Posts, Tool Post Rings and Wedges, Machine and Crank Handles, and also Eye Bolts and their new line of Vulcan Hoist Hooks. Their exhibit includes over 400 different special Drop Forgings in aluminum, bronze, copper, iron and steel for a variety of mechanical purposes, such as automobiles,

fitted up in the exhibit, and the European business of J. H. Williams & Co. is for the time transacted from this place. This exhibit is one of the most complete and best arranged at the Exposition.

#### Requests for Catalogues, &c.

**N**ASH HARDWARE COMPANY, Fort Worth, Texas, wholesalers and retailers, have incorporated with a capital stock of \$40,000, fully paid. The following are the officers and directors of the new company: Chas. E. Nash, president and general manager; A. E. Want, vice-president; Arthur D. Hodgson, secretary and treasurer; S. C. Jackson, Geo. R. Clayton, and Mrs. J. E. B. Nash. Since their fire on May 28 last the company have put in a complete new stock of Shelf and Heavy Hardware, Stoves, Tinware and Sporting Goods. They have also increased their storage and track facilities so that they are in position to do a larger business than heretofore. They have just put two men on the road to work adjacent territory in North Texas and Indian Territory. The com-

pany will be pleased to receive catalogues, price-lists, &c., from manufacturers.

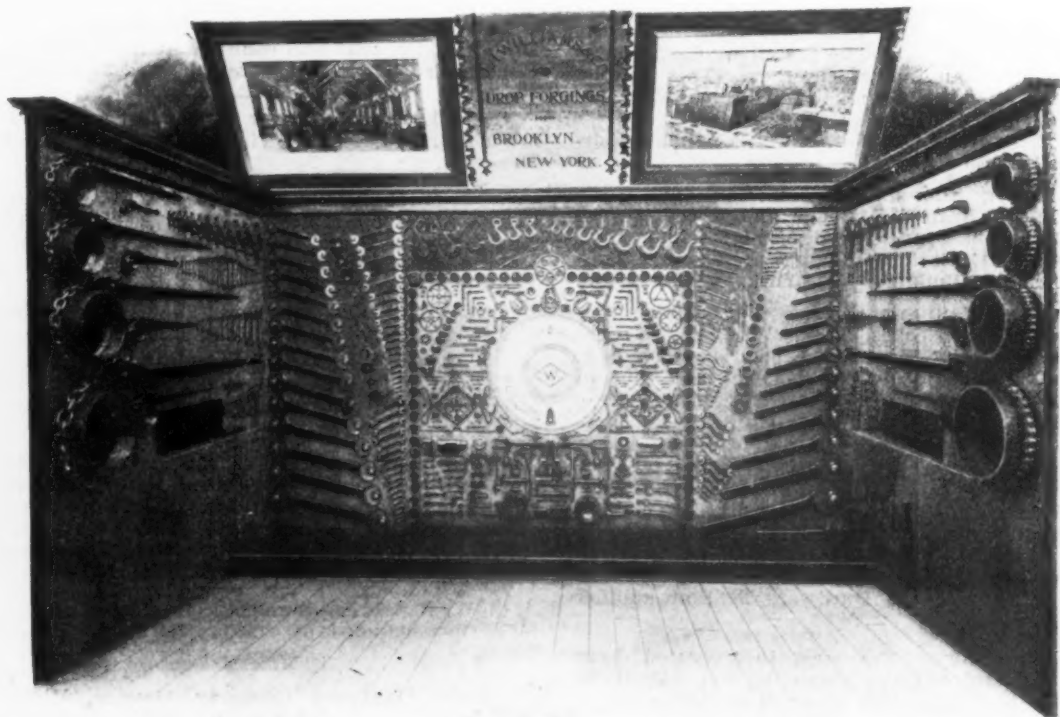
As announced in our last issue, the branch house of the Fairbanks Company, at 604-608 Canal street, New Orleans, La., was destroyed by fire on the 31st ult. Having a large stock of goods in an independent storehouse, the company are in position to execute orders and continue business. All their trade literature was destroyed by the fire, and the company will accordingly be pleased to receive catalogues, price-lists, quotations, &c., from manufacturers of such lines of goods as they have heretofore handled.

Wales-Hunt Hardware Company, Converse, Ind., have succeeded Wales & Hunt. The firm consist of Chas. N. Wales, Chas. W. Hunt and Milton Macy, who have for a number of years been identified with the Hardware business in Converse. They expect to occupy a new two-story brick building about the 15th inst. It will have an elevator of sufficient size to hoist Carriages,

term of years marketed the Stephens vises. One of the firm of Tower & Lyon is going abroad in the interest of the vise business in the near future. The Stephens Vise was first manufactured by Nathan Stephens something like 40 years ago, a great deal of money having been spent on the construction of the vise, and a big stock made by the Colt factory in Hartford. When Nathan Stephens died he was succeeded by Melvin Stephens, who has, because of other large interests, been prevented from giving it the attention he would have liked. The manufacture of these goods has now passed into the hands of the National Vise & Tool Works, who have ample means to prosecute their manufacture and sale. Tower & Lyon are equipping themselves to market the product of this factory and are securing an additional force, preparatory to visiting every city and large sized town in the United States. The foreign trade will likewise receive their attention.

### Trade Items.

**T**OWER & LYON, 95 Chambers street, New York, have made some changes in the foot plates of their Ice Skates for the coming season. For years past the plates have had square toes. Last year they tried



Wagons and Farming Implements to the second floor. One side of the first floor will be provided with shelving from floor to ceiling, with rolling ladder. This will be devoted to their stock of small Hardware. The firm will also handle Harness, Buggies, Engines, Well Supplies, &c. They will appreciate copies of catalogues, &c., as well as quotations from the trade.

Clifford Arrick, Indianapolis, Ind., manufacturers' agent and contractor for United States, State and municipal supplies, will appreciate catalogues and quotations from manufacturers of Heavy and Shelf Hardware, Tinware, Glassware and Woodenware.

### National Vise & Tool Works.

**T**HE NATIONAL VISE & TOOL WORKS, Ninth and Market streets, Camden, N. J., is the title of a new concern recently organized, who have taken over the vise business of W. E. Snediker, Jersey City. Mr. Snediker has long been the manufacturer of the well-known Stephens & Snediker quick adjusting vises, and is still the practical head of the manufacturing end of the business. Tower & Lyon, 95 Chambers street, New York, are the direct representatives of the company and have control of their entire output, both for the export and home trade, they having for a long

the experiment in a few models with round, pointed toes. This innovation received so much commendation everywhere that dealers realized that their customers preferred this style to the square toe. This feature has been carried out in their entire line, so far as has been practicable.

FREDERICK KLAGES, 127 Duane street, New York, who went to Europe on a combined business and pleasure trip about six weeks ago, is expected back this week.

JAS. G. BAILEY AND JOHN UNDERWOOD announce under 13th ult., that the business carried on by them under the style of the Steel Harrow Company, New Glasgow, N. S., will hereafter be conducted under the name of the Bailey-Underwood Company, the membership of the firm continuing as heretofore.

OTTO H. WITTE, president of the Witte Hardware Company, St. Louis, has returned from a summer outing at Elkhart Lake, Wis.

THE next annual convention of the National Hardware Association will be held in Richmond, Va., on November 14, 15 and 16. The official headquarters will be at the Hotel Jefferson. W. S. Donnan of W. S. Donnan & Co., Richmond, is chairman of the entertainment committee.

WIEBUSCH & HILGER, 9-15 Murray street, New York, have been appointed the sole agents for all markets, domestic and foreign, of the John T. Henry Mfg. Com-



pany, Hamden, Conn., who are well-known manufacturers of a full line of Pruning Shears.

### Price-Lists, Circulars, &c.

THE W. C. HELLER & Co., Montclair, N. J.: Heller's Mice Proof Seed Cases. A catalogue gives revised price-lists of these goods, with illustrations.

E. C. ATKINS & Co., Indianapolis, Ind.: Under the title, "I Have, Have You?" the company issue a pamphlet giving a number of testimonials from concerns all over the country relative to Atkins' Saws.

NIAGARA SILVER COMPANY, Niagara Falls, N. Y.: Electro Silver Plated Table Ware. A catalogue and price-list illustrates Spoons, Knives, Forks, &c., Plated, Aluminum and Sterling.

CHICAGO WHEEL & MFG. COMPANY, Chicago, Ill.: Catalogue D. 1900. Illustrations and prices are given of Emery Wheels, Grinding Machinery, Polishing Wheels, Disks, Emery Sticks, Corundum, Oil and Axe Stones, Knife Sharpeners, Scythe Stones, Hones, &c.

P. & F. CORBIN, New Britain, Conn.: Two illustrated descriptive booklets showing the Corbin Door Check and Spring, printed in German and French for foreign distribution. They are illustrated in detail and show the possibilities of this commodity.

ASPHALT READY ROOFING COMPANY, 136 Water street, New York: Illustrated catalogue describing the Trinidad Asphalt products manufactured by them. This includes Asphalt Ready Roofing, Genuine Asphaltum Paints and Varnishes, Trinidad Asphalt Roofing Cement, Asphalt Damp Proof, Roofers' Supplies, Natural Asphalt Felts and Trinidad Refined Asphalt.

TERRE HAUTE SHOVEL & TOOL COMPANY, Terre Haute, Ind.: Illustrated catalogue and price-list of a full line of Shovels, Spades, Scoops and Ditching Tools of all kinds. W. C. Barker & Co. are the export agents. Produce Exchange Building, New York.

F. CLINE MFG. COMPANY, Chicago, Ill.: Circular illustrating Shower Bath Yokes, Steam Washers, &c. The Gem Stove Polishing Set, of which mention is made in the circular, includes a dauber, polisher and tube of stove polish, all packed in a neat carton.

### Among the Hardware Trade.

R. L. Warner, Eden Valley, Minn., has disposed of his Hardware, Stove and Agricultural Implement business to J. O. Jenkins, formerly of Maple Lake, Minn., where he was for 12 years engaged in the same line. Mr. Warner may re-enter the Hardware field at another point.

The Baird Hardware Company, Incorporated, have succeeded E. Baird & Co., Gainesville, Fla. E. Baird is president of the corporation, who will conduct a wholesale and retail business, largely retail.

Gunn & Ferguson, Healdsburg, Cal., have materially enlarged their establishment and have added two departments to their business, Paints, Oils, &c., and Plumbing.

Charles Hydon, dealer in Stoves and Tinware, Vernon, N. Y., has removed to new quarters.

C. E. England's Hardware store, Durant, I. T., was recently damaged by fire to the extent of about \$1300, fully covered by insurance.

The Hardware stock of Childerhouse & Gibson, St. Thomas, N. D., has been destroyed by fire.

Boyd, Ellis & Co. have succeeded Boyd Bros. & Co. in the Hardware, Stove, Agricultural Implement, Wagon and Buggy and furniture business at Pittsburgh, Tex.

The Hardware store of J. C. Tanger & Co., Hanover, Pa., was recently destroyed by fire.

Colter Bros. have purchased the Hardware business of F. R. McKee, Elmo, Mo.

Smale & Glasple are a new firm at Oxford, Mich., handling a general line of Hardware.

Hamlin & Redfield have succeeded John C. Hamlin in the Hardware business at Smethport, Pa.

A. B. Clippinger has disposed of his Hardware business at Centralia, Kan., to George Grover, who will con-

tinue at the old stand. Mr. Clippinger will continue the manufacture of Water Tanks, Portable Cribs, &c., at Centralia.

Chester M. Warner has purchased the Hardware, Stove and Farm Implement business of J. E. Wilson, Olivet, Kan.

W. G. Branson, Las Animas, Colo., has disposed of a half interest in his wholesale and retail business to George Kramer, and the style of firm has become Branson & Kramer.

The establishment of H. C. Reiter, Pittsburgh, Pa., was damaged by fire a short time since. Repairs have been completed and Mr. Reiter is again in shape for the transaction of business.

The store of F. J. Brattin, Nashville, Mich., has been slightly damaged by fire. The damage, estimated at \$1000, was confined to wareroom and tin shop and did not affect the salesroom. Mr. Brattin expects to be fully settled again by the 20th inst.

L. E. Collins & Son have succeeded W. D. Freeman, Bronson, Kan., as retailers of Hardware, Stoves, Tinware, Farming Implements, Sporting Goods, &c.

Joshua Chatterton, for 30 years in the Hardware business at Three Oaks, Mich., has disposed of his stock to E. G. Hamlin, who will continue at the old stand. Mr. Hamlin also conducts a store at Grand Junction.

Cyrus L. Jenness, Dover, N. H., lost a storehouse by fire a short time since. The loss was fully covered by insurance.

W. J. Hubbard, Shuqualak, Miss., has built an addition to his establishment, 26 x 80 feet. Mr. Hubbard does a wholesale and retail business. He is also interested in stores at Hashuqua and Wahalak.

C. W. Smith has purchased the Hardware business at Edwardsburg, Mich., to John Walker.

Kellogg Hardware & Implement Company, Chalmers, Ind., have been incorporated with a capital stock of \$4500.

The firm of Losey & Co., Easton, Pa., having been dissolved by the death of Edmund Losey, will hereafter be conducted as Losey & Co., Incorporated. The officers of the corporation are James W. Long, president; O. D. Ayers, vice-president; C. R. Rodenburgh, treasurer, and J. L. Evans, secretary.

C. W. Smith has purchased the Hardware business formerly conducted by O. H. McGavock at Lockney, Texas.

Owosso Hardware Company, Owosso, Mich., have been incorporated with a capital stock of \$10,000. The officers and incorporators are: E. A. Achard, president; W. A. Achard, vice-president; F. W. Pearce, secretary and manager, and F. C. Achard, treasurer. A wholesale and retail business will be carried on in Shelf and Heavy Hardware, Stoves and Tinware, Sporting Goods, &c.

The Hardware firm of Stapleton & Sellers, Blackwell, Okla., have been dissolved. W. P. Stapleton will continue under his own name.

Clark, Allison & Daniels have succeeded Clark & Allison, Sheridan, Mo.

Ford & Parker have succeeded Frank Strong in the Hardware, Stove and Plumbing business in Dalton, Mass.

The Hardware and Implement stock of M. L. Powers has been removed from Dougherty to Ada, I. T., where Mr. Powers is now located.

Johnson, Billingsley & Co. are successors to Johnson & Billingsley, Paris, Texas, dealers in Hardware, Stoves, Agricultural Implements, Sporting Goods, &c.

W. C. Parker has sold out his Hardware, Stove and Sporting Goods business, Little Valley, N. Y., to E. E. Parsons, who will continue at the old stand.

John Hughes, Gretna, Neb., has disposed of his stock of lumber, but will continue in the Hardware and Harness line. Mr. Hughes has lately erected a new building and has also enlarged his old quarters.

J. A. Baxter Company, Watsonville, Cal., have removed to larger and more commodious quarters.

Guinn & Jay have succeeded Huntsville Hardware Company, Huntsville, Ark.

F. Taylor Cain's store, at Sedalia, Mo., was slightly damaged by fire a short time since.

A. J. Heare has purchased the Hardware and furniture business of R. M. Wilson, Dawn, Mo.

Mesick Hardware Company, Mesick, Mich., have added 20 feet to their establishment for the purpose of enlarging their stock.

### Miscellaneous Notes.

#### Whitman & Barnes Mfg. Company.

The Whitman & Barnes Mfg. Company, Akron, Ohio, and 111 Chambers street, New York, have recently added to their line of mechanical rubber goods, rubber bands, including the thread, heavy and package styles. They

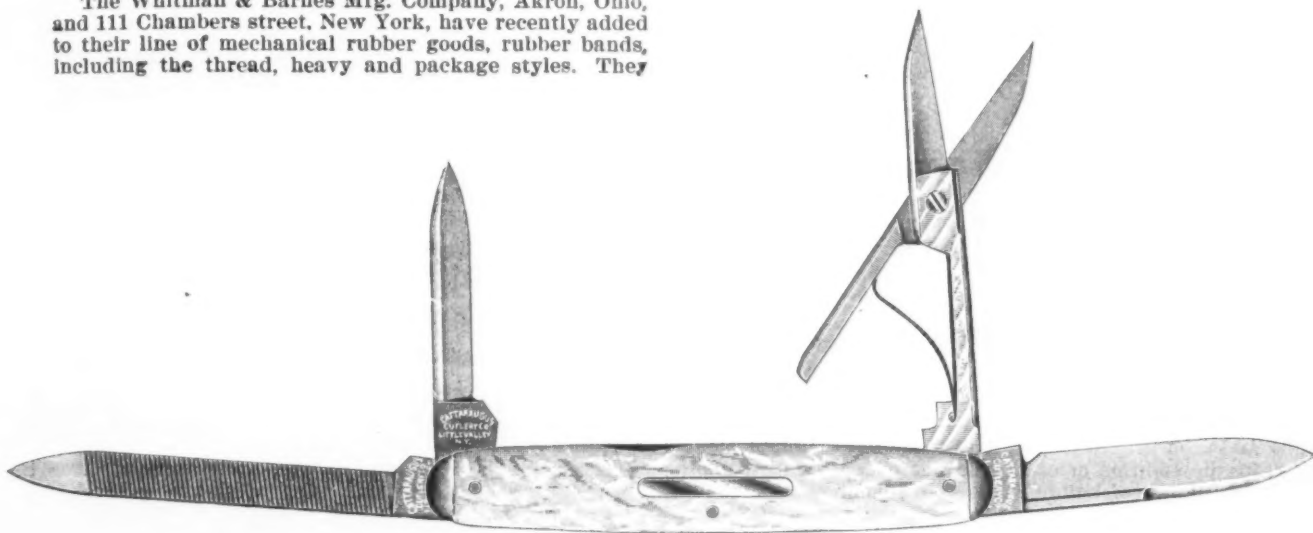
of the knives have gun metal scales with pond lilies, forget-me-nots, &c., enameled in cream and other rich colors.

#### Gem Oilers.

The Gem Mfg. Company, Second avenue and Wood street, Pittsburgh, Pa., manufacturers of the Gem oil cans, advise us that they are now making these oilers in pint and half pint sizes, either in brass or steel, and with 4, 5 and 9 inch spouts. A good demand is reported for this type of oil can.

#### Fine Combination Scissor Knife.

The Cattaraugus Cutlery Company, Little Valley, N. Y., have made the knife herewith shown for the Senators and members of the Assembly of the State of New York. The knife is referred to as handsome, with blades of the best quality steel. It is polished through-



*Fine Combination Scissor Knife.*

have been making a line of these goods for their own use and some special customers, at the rubber works department of their factory, since last March, but are now prepared to furnish the goods to the general trade. In this connection we are advised they have in their employ at this factory men who have had long experience with some of the largest rubber manufacturers in the country. Only the best material will be used.

#### Manicure, Shaving and Scissor Sets, &c.

Graef & Schmidt, 107 Chambers street, New York, sole agents in the United States for Joseph Henckels, Solingen, Germany, have now on exhibition a large line of new goods especially suitable for fall and holiday trade, and just arrived from the other side. In manicure sets they are showing entirely new and novel designs, both in rich cases and the plainer styles. Some are in beautiful bird's-eye maple cases, alligator, snake, pigskin, Russia, Morocco, calf skin and a highly enameled leather, resembling tortoise shell, some of the cases described

out, has a manicure and nickel plated scissors, the whole, it is remarked, being of excellent proportions and perfect workmanship.

#### Woods' Adjustable Can Opener.

Woods, Bacon & Co., 127 Duane street, New York, have just put on the market the Woods can opener, here illustrated. The particular feature of this can opener is that it is instantly self adjusting to any size of circular can, and has also a separate device for opening square and oval, or any kind of irregular cans. In use the point at the end is inserted in the center of the can top and the movable cutter forced into the tin at the proper point, the sliding cutter moving freely back and forth, held in position by pressure of the thumb. The shank is drop forged from cold rolled steel. Both cutters are made of tempered tool steel. A feature of the cutter nearest the end for square or irregular cans is a V-shaped sharpened lip, which grips the tin and gives a purchase for the cutter which follows, the V-shaped lip not being adequately shown in the cut. This part of the



*Woods' Adjustable Can Opener.*

being used for work boxes and scissor sets as well. They also show shaving sets for tourists and travelers, bound in leather with compartments for razors, strop, brush, soap and beveled mirror. Some styles are in flexible folding cases for razors only, others being made of fine wood and leather in the form of boxes, holding a razor for each day of the week, those in flexible cases having the name of the day etched on the handle, while the razors in boxes have the day of the week etched on the back of the blade. Another novelty is a line of pocket knives having gun metal scales with hand work gilt etchings, for the fine trade, each particular style of knife having four different patterns of etching. Some

opener is peculiarly suitable for opening cans containing meats, vegetables, &c., where it is necessary to remove the contents of the can entire, as this turns the burr of the metal outward, cutting below the top of the can. They are made in nickel or plain finish, there being three styles. No. 100 is a combination can opener for round or square cans, having an enameled wooden handle. No. 75 is represented in the accompanying illustration, and is similar to the No. 100, without wood handle. No. 50 is suitable for round cans only, not having the cutter for square cans seen in the No. 75. The Hardware Merchandise Company, 127 Duane street, New York, market this opener exclusively in Southern territory.



### New Century Design.

Russell & Erwin Mfg. Company, New Britain, Conn., and 43-47 Chambers street, New York, have just put on the market the New Century store door handle, as here illustrated. This style of ornamentation is Grecian in character and it is their intention ultimately to carry it through an entire line of iron and bronze metal hardware for outside and inside trim. It is now obtainable in front, inside and sliding door lock sets, thumb latches

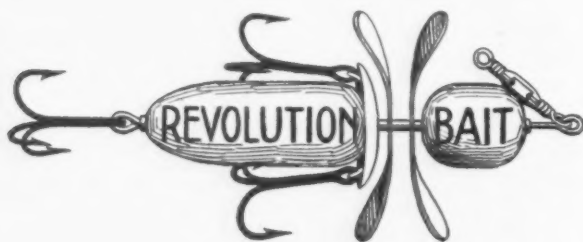


*New Century Design.*

and sash lifts, which in the future will be supplemented by the addition of other small articles used in trimming the interior of buildings, as sash fasts, draw pulls, push buttons, &c.

### The Revolution Bait.

William Shakespeare, Jr., Kalamazoo, Mich., is putting on the market a trolling bait, as here shown. It is made largely of aluminum, is provided with nine hooks, and is suitable for trolling, casting and splashing. The peculiar construction of the blades allows the bait, it is explained, to be drawn through rushes and weeds without snagging the hooks. The bait is recommended

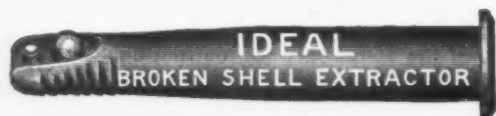


*The Revolution Bait.*

by the maker as particularly good for catching bass, pickerel, muskellunge and every fish that takes a live bait. The manufacturer claims that the bait catches more and larger fish than live bait when used at the same time and place.

### The Ideal Broken Shell Extractor.

The accompanying cut represents a broken shell extractor, put on the market by the Ideal Mfg. Company,



*The Ideal Broken Shell Extractor.*

New Haven, Conn. The extractor is referred to as simple and strong, as requiring no adjusting and as self-contained, with no parts which might be lost. The ex-

tractor is made of soft steel, case hardened. The ball run is on an incline, and the ball wedge is made of steel, hardened, and ground to the proper size, made to last a lifetime. It is pointed out that when shells break they will many times part in the middle, leaving the muzzle portion of the shell in the chamber of the gun. The object of the extractor is to remove a broken shell without taking down the gun or injuring the chamber. The extractors are now made in the following sizes: 32-40 Marlin and Winchester, 32-40 Remington, 30-30 Marlin and Winchester, .303 Savage, .303 British and 30-40 U. S. A.

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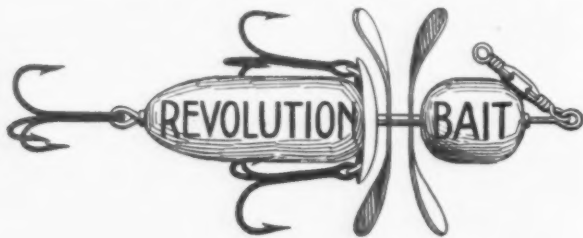


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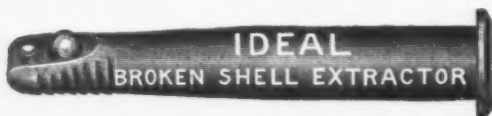


*The Revolution Bait.*

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# Current Hardware Prices.

REVISED SEPTEMBER 11, 1900.

**General Goods.**—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail merchants. Very small orders and broken packages often command higher prices while lower prices are frequently given to larger buyers.

**Special Goods.**—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

## Adjusters Blind—

Domestic,  $\frac{1}{2}$  doz. \$3.00... 33¢  
North's... 10¢  
Zimmerman's—See Fasteners, Blind.

## Window Stop—

Ives' Patent... 25¢  
Tapias' Perfection... 50¢

**Ammunition**—See Caps, Cartridges, Shells, &c.

## Anvils—American—

Eagle Anvil... 7 1/2 @ 77¢  
Hay-Budden, Wrought... 9 @ 94¢  
Horseshoe brand, Wrought... 9 @ 94¢  
Samson... 7 @ 74¢  
Trenton, Wrought... 8 @ 84¢  
Buel Pat. Trenton Wrought... 8 @ 84¢  
Vulcan Wrought... 8 @ 84¢

## Imported—

Armstrong's Mouse Hole... 8 1/2 @ 84¢  
Peter Wright's... 9 @ 94¢

**Anvil, Vise and Drill—**

Millers Falls Co., \$18.00... 20¢

**Apple Parers**—See Parers, Apple, &c.

**Aprons, Blacksmiths'—**

Hull & Hoyt Co.:  
Lots of 1 doz... 25¢  
Small or Lots... 25¢  
Lots of 3 doz... 30¢

**Augers and Bits—**

Common Double Spur... 60¢  
Boring Machine Augers... 60¢

Car Bits, 12-in. twist... 60¢  
Jennings' Pattern... 60¢

Auger Bits... 60¢  
Ford's Auger and Car Bits... 40¢

Forstner Pat. Auger Bits... 25¢  
C. E. Jennings & Co.:  
No. 10 Ext. Lip, R. Jennings' List... 4¢  
No. 30, R. Jennings' List... 5¢

Russell Jennings... 25¢  
L'Hommedieu Car Bits... 15¢  
Pugh's Black... 20¢

Pugh's Jennings' Pattern... 35¢  
Snell's Auger Bits... 60¢  
Snell's Bell Hanger's Bits... 60¢

Snell's Car Bits, 12-in. twist... 60¢  
Wright's Jennings Bits (R. Jennings' List)... 50¢

**Bit Stock Drills—**

Standard List... 65¢

**Expansive Bits—**

Clark's small, \$18; large, \$26... 50¢  
Lavigne's Clark's Pattern, No. 1, doz... 20¢  
C. E. Jennings & Co., Steer's Pat... 35¢  
Swan's... 60¢

**Gimlet Bits—**

Common Double Cut, gro. \$3.75 @ 3.25  
German Pattern... gro. \$5.00 @ 5.50  
Double Cut, makers' lists... 45¢

**Hollow Augers—**

Amos... 25¢  
Bonney's Adjustable,  $\frac{1}{2}$  doz... 16¢  
New Patent... 25¢  
Universal... 20¢

**Ship Augers and Bits—**

Forstner's... 40¢  
C. E. Jennings & Co.:  
L'Hommedieu's... 15¢  
Watrous'... 40¢

**Awl Hafts, See Hafts, Awl.**

**Awls—**

Brad Awls:  
Handled... gro. \$2.75 @ 3.10  
Unhandl'd, Shouldered gro. \$3 @ 3.50  
Unhandl'd, Patent... gro. 66¢ @ 70¢

Peg Awls:  
Unhandl'd, Patent... gro. 31¢ @ 35¢  
Unhandl'd, Shouldered gro. 65¢ @ 70¢

Scratch Awls:  
Handled, Common... gro. \$4.50 @ 4.00  
Handled, Socket... gro. \$11.50 @ 12.00

**Awl and Tool Sets—See Sets, Awl and Tool.**

**Axes**

First Quality, best brands... \$5.25 @ 5.50  
First Quality, other brands... \$5.00 @ 5.25  
Jobbers' Special Brands:  
Good Quality... \$5.00 @ 5.50  
Best Quality... \$5.25

Cheap, Handled Axes... \$5.50 @ 5.75  
Beveled, add 25¢ doz.

**Axle Grease—See Grease, Axle.**

**Axles—**

Concord, Loose Collar... 5¢  
Concord, Solid Collar... 5¢  
No. 1 Common... 3¢  
No. 1 & 2 Com. New Style... 4¢  
No. 2 Solid Collar... 4¢  
Nos. 7, 8, 11 to 14... 70¢  
Nos. 15 to 18... 80¢  
Nos. 19 to 22... 70¢

**Boxes, Axle—**

Common and Concord, not turned... 15¢  
Common and Concord, turned... 15¢  
Half Patent... 15¢

**Balances—**

Caldwell new list... 50¢  
Poulman's... 60¢

**Spring—**

Spring Balances... 50¢  
Chatillon's No. 1... 40¢  
Chatillon's No. 2... 40¢  
Chatillon's Large D. A. I... 40¢  
P. A. I... 60¢

**Barb Wire—See Wire, Barb.**

**Bars—**

Steel Crowbars, 10 to 40 lb., per lb... 3¢  
Steel Crowbars, 10 to 40 lb., per lb... 3¢

**Beams, Scale—**

Scale Beams, List Jan. 12, '98... 30¢  
Chatillon's No. 1... 40¢  
Chatillon's No. 2... 40¢

**Beaters—**

Standard Co.:  
No. 5 Steel Handle Dover... \$6.50  
No. 10 Cast Handle Dover... \$8.00  
No. 10 St-el Handle Dover... \$8.00  
No. 15 Extra Heavy Steel Handle... \$15.00

Rival,  $\frac{1}{2}$  doz... \$1.00  
Taplin Mfg. Co.:  
No. 50 Small Family size... \$3.50  
No. 100 Regular Family size... \$8.00  
No. 102 Regular Family size, tinned... \$9.50

No. 150 Large Family size... \$15.00  
No. 152 Large Family size, tinned... \$17.00

Lyon's, Standard size... \$17.75  
Wonder (S. S. & Co.)... \$7.50

**Bellows—**

Blacksmith, Standard List... 70¢  
C. E. Jennings & Co., Blacksmith... 100¢  
C. E. Jennings & Co., Hand... 35¢

**Blacksmiths—**

Inch... 30 33 36 39 40  
Each... \$3.70 5.95 4.65 5.10 7.65

Extra Length:  
Each... \$4.25 4.85 5.40 5.95 6.80 7.95

**Molders—**

Inch... 9 10 11 12 14 16  
Doz... \$6.75 7.25 8.50 9.50 12.00 14.50

**Hand—**

Inch... 6 7 8 9 10 12  
Doz... \$3.75 4.25 4.50 5.00 5.75 6.75

**Bells—**

Ordinary goods... 75¢  
High grade... 70¢  
Jersey... 75¢  
Texas Star... 60¢

**Door—**

Abbe's Gong... 45¢  
Barton Gong... 55¢  
Gong, Yankee... 50¢  
Home R. & E. Mfg. Co.'s... 50¢  
Lever and Pull, Sargent's... 30¢

**Hand—**

Hand Bells, Polished... 65¢  
Whistle Metal... 65¢  
Nickel Plated... 60¢  
Swiss... 60¢  
Silver Chime... 85¢

**Miscellaneous—**

Farm Bells... 10¢  
Steel Alloy Church and School... 50¢  
Wilmot & Hobbs Mfg. Co., Gongs... 70¢

**Belting Rubber—**

Common Standard... 70¢  
Standard... 60¢  
Extra... 60¢  
High Grade... 60¢  
Extra Heavy, Short Lap... 50¢

**Leather—**

Common... 65¢  
Norway Phila., list Oct. 16, '94... 75¢  
Eagle Phila., list Oct. 16, '94... 77¢  
Bay State, list Dec. 28, '99... 85¢  
Franklin Moore Co.:  
Norway Phila., list Oct. 16, '94... 75¢  
Eagle Phila., list Oct. 16, '94... 77¢  
Eclipse, list Dec. 28, '99... 85¢  
Port Chester Bolt & Nut Company  
Empire, list Dec. 28, '99... 85¢  
Keystone Phila., list Oct. '94... 77¢  
Norway Phila., list Oct. '94... 75¢

**Regular Short Lap... 60¢**

**Standard... 60¢**

**Light Standard... 70¢**

**Cott in—**

Rossendale-Riddaway B. & H. Co.:  
Sphinx B-and... 60¢  
Durable Bran... 70¢

**Bench Stops—See Stops, Bench**

**Benders and Upsetters, Tire—**

Green River Tire Benders and Upsetters... 20¢  
Stoddard's Lightning Tire Upsetters... 40¢

**Bicycle Goods—**

John S. Long's Son's 1899 list:  
Chain... 50¢  
Paris... 50¢  
Spokes... 50¢  
Tub... 60¢

**Bits—**

Auger, Gimlet, Bit Stock Drills, &c.—  
See Augers and Bits.

**Bit Holders—See Holders.**

**Blind Adjusters—See Adjusters, Blind.**

**Blind Fasteners—See Fasteners, Blind.**

**Blind Staples—See Staples, Blind.**

**Blocks—Tackle—**

Common Wooden... 70¢  
Cleave and Steel... 80¢  
Eddy's steel... 80¢  
Hartz steel... 50¢  
Ford's Star Brand Self Lubricating... 60¢

Hollow Steel, Ford's Pat. Star Brand... 50¢

Lane's Patent Automatic Lock and Junior... 30¢

Stowell's Novelty, Mal. Iron... 50¢  
See also Machines, Hoisting.

**Boards, Stove—**

Zinc, Crystal, &c... 50¢

**Boils—**

Carriage, Machine &c.—  
Common, list Jan. 3, '95... 70¢  
Norway Iron, \$3.00, list Oct. 7, '94... 75¢

Phila., Eagle, \$3.00 list May 24, '99... 85¢  
Bolt Ends, list Jan. 3, '95... 70¢

Machine, list Oct. 1, '99... 75¢

**NOTE.—Jobbers' prices on Boils are now often lower than manufacturers', and the market is irregular.**

**Door and Shutter—**

Cast Iron Barrel, Round Brass Knob:  
Inch... 3 4 5 6 8  
Per doz... \$0.35 .55 .65 .75 .90

Cast Iron Spring Foot:  
Inch... 6 8 10  
Per doz... \$1.00 1.25 1.75

Cast Iron Chain, Flat, Japanned:  
Inch... 6 8 10  
Per doz... \$0.85 1.20 1.50

Cast Iron Shutter, Brass Knobs:  
Inch... 6 8 10  
Per doz... \$0.80 .90 1.15

Wrought Barrel Brass Knob:  
Inch... 3 4 5 6 8  
Per doz... \$0.44 .50 .61 .70 1.23

Wrought Barrel... 70¢  
Wrought... 60¢  
Wrought Flush B. K... 50¢  
Wrought Shutter... 40¢  
Wrought Square Neck... 50¢  
Wrought Sunk... 50¢  
Ives' Patent Door... 60¢

**Stove and Plow—**

Plow... 60¢  
Stove... 60¢

**Tire—**

Common... 65¢  
American Screw Company:  
Norway Phila., list Oct. 16, '94... 75¢  
Eagle Phila., list Oct. 16, '94... 77¢  
Bay State, list Dec. 28, '99... 85¢  
Franklin Moore Co.:  
Norway Phila., list Oct. 16, '94... 75¢  
Eagle Phila., list Oct. 16, '94... 77¢  
Eclipse, list Dec. 28, '99... 85¢  
Port Chester Bolt & Nut Company  
Empire, list Dec. 28, '99... 85¢  
Keystone Phila., list Oct. '94... 77¢  
Norway Phila., list Oct. '94... 75¢

**Borers, Tap—**

Borers Tap, Ring, with Handle:  
Inch... 1 1 1/2 1 3/4 2 2 1/2 3 3 1/2 4 4 1/2 5 5 1/2 6 6 1/2 7 7 1/2 8 8 1/2 9 9 1/2 10 10 1/2 11 11 1/2 12 12 1/2 14 14 1/2 16 16 1/2 18 18 1/2 20 20 1/2 22 22 1/2 24 24 1/2 26 26 1/2 28 28 1/2 30 30 1/2 32 32 1/2 34 34 1/2 36 36 1/2 38 38 1/2 40 40 1/2 42 42 1/2 44 44 1/2 46 46 1/2 48 48 1/2 50 50 1/2 52 52 1/2 54 54 1/2 56 56 1/2 58 58 1/2 60 60 1/2 62 62 1/2 64 64 1/2 66 66 1/2 68 68 1/2 70 70 1/2 72 72 1/2 74 74 1/2 76 76 1/2 78 78 1/2 80 80 1/2 82 82 1/2 84 84 1/2 86 86 1/2 88 88 1/2 90 90 1/2 92 92 1/2 94 94 1/2 96 96 1/2 98 98 1/2 100 100 1/2 102 102 1/2 104 104 1/2 106 106 1/2 108 108 1/2 110 110 1/2 112 112 1/2 114 114 1/2 116 116 1/2 118 118 1/2 120 120 1/2 122 122 1/2 124 124 1/2 126 126 1/2 128 128 1/2 130 130 1/2 132 132 1/2 134 134 1/2 136 136 1/2 138 138 1/2 140 140 1/2 142 142 1/2 144 144 1/2 146 146 1/2 148 148 1/2 150 150 1/2 152 152 1/2 154 154 1/2 156 156 1/2 158 158 1/2 160 160 1/2 162 162 1/2 164 164 1/2 166 166 1/2 168 168 1/2 170 170 1/2 172 172 1/2 174 174 1/2 176 176 1/2 178 178 1/2 180 180 1/2 182 182 1/2 184 184 1/2 186 186 1/2 188 188 1/2 190 190 1/2 192 192 1/2 194 194 1/2 196 196 1/2 198 198 1/2 200 200 1/2 202 202 1/2 204 204 1/2 206 206 1/2 208 208 1/2 210 210 1/2 212 212 1/2 214 214 1/2 216 216 1/2 218 218 1/2 220 220 1/2 222 222 1/2 224 224 1/2 226 226 1/2 228 228 1/2 230 230 1/2 232 232 1/2 234 234 1/2 236 236 1/2 238 238 1/2 240 240 1/2 242 242 1/2 244 244 1/2 246 246 1/2 248 248 1/2 250 250 1/2 252 252 1/2 254 254 1/2 256 256 1/2 258 258 1/2 260 260 1/2 262 262 1/2 264 264 1/2 266 266 1/2 268 268 1/2 270 270 1/2 272 272 1/2 274 274 1/2 276 276 1/2 278 278 1/2 280 280 1/2 282 282 1/2 284 284 1/2 286 286 1/2 288 288 1/2 290 290 1/2 292 292 1/2 294 294 1/2 296 296 1/2 298 298 1/2 300 300 1/2 302 302 1/2 304 304 1/2 306 306 1/2 308 308 1/2 310 310 1/2 312 312 1/2 314 314 1/2 316 316 1/2 318 318 1/2 320 320 1/2 322 322 1/2 324 324 1/2 326 326 1/2 328 328 1/2 330 330 1/2 332 332 1/2 334 334 1/2 336 336 1/2 338 338 1/2 340 340 1/2 342 342 1/2 344 344 1/2 346 346 1/2 348 348 1/2 350 350 1/2 352 352 1/2 354 354 1/2 356 356 1/2 358 358 1/2 360 360 1/2 362 362 1/2 364 364 1/2 366 366 1/2 368 368 1/2 370 370 1/2 372 372 1/2 374 374 1/2 376 376 1/2 378 378 1/2 380 380 1/2 382 382 1/2 384 384 1/2 386 386 1/2 388 388 1/2 390 390 1/2 392 392 1/2 394 394 1/2 396 396 1/2 398 398 1/2 400 400 1/2 402 402 1/2 404 404 1/2 406 406 1/2 408 408 1/2 410 410 1/2 412 412 1/2 414 414 1/2 416 416 1/2 418 418 1/2 420 420 1/2 422 422 1/2 424 424 1/2 426 426 1/2 428 428 1/2 430 430 1/2 432 432 1/2 434 434 1/2 436 436 1/2 438 438 1/2 440 440 1/2 442 442 1/2 444 444 1/2 446 446 1/2 448 448 1/2 450 450 1/2 452 452 1/2 454 454 1/2 456 456 1/2 458 458 1/2 460 460 1/2 462 462 1/2 464 464 1/2 466 466 1/2 468 468 1/2 470 470 1/2 472 472 1/2 474 474 1/2 476 476 1/2 478 478 1/2 480 480 1/2 482 482 1/2 484 484 1/2 486 486 1/2 488 488 1/2 490 490 1/2 492 492 1/2 494 494 1/2 496 496 1/2 498 498 1/2 500 500 1/2 502 502 1/2 504 504 1/2 506 506 1/2 508 508 1/2 510 510 1/2 512 512 1/2 514 514 1/2 516 516 1/2 518 518 1/2 520 520 1/2 522 522 1/2 524 524 1/2 526 526 1/2 528 528 1/2 530 530 1/2 532 532 1/2 534 534 1/2 536 536 1/2 538 538 1/2 540 540 1/2 542 542 1/2 544 544 1/2 546 546 1/2 548 548 1/2 550 550 1/2 552 552 1/2 554 554 1/2 556 556 1/2 558 558 1/2 560 560 1/2 562 562 1/2 564 564 1/2 566 566 1/2 568 568 1/2 570 570 1/2 572 572 1/2 574 574 1/2 576 576 1/2 578 578 1/2 580 580 1/2 582 582 1/2 584 584 1/2 586 586 1/2 588 588 1/2 590 590 1/2 592 592 1/2 594 594 1/2 596 596 1/2 598 598 1/2 600 600 1/2 602 602 1/2 604 604 1/2 606 606 1/2 608 608 1/2 610 610 1/2 612 612 1/2 614 614 1/2 616 616 1/2 618 618 1/2 620 620 1/2 622 622 1/2 624 624 1/2 626 626 1/2 628 628 1/2 630 630 1/2 632 632 1/2 634 634 1/2 636 6





**Cimlets—**  
Nail, Metal, Assorted, gro. \$1.50@1.75  
Spike, Metal, Assorted, gro. \$3.00@3.50  
Nail, Wood Handled, Assorted,  
gro. \$4.00@4.25  
Spike, Wood Handled, Assorted,  
gro. \$5.00@5.25

**Class, American Window**  
List Jan 1, 1898.

Small lots from store:  
Single, Eastern.  
First Bracket. .85¢  
Second and Third Brackets. .85¢  
Eastern, All Other Brackets. .85¢  
Double, Eastern.  
First Bracket. .85¢  
Second, Third, Fourth and Fifth  
Brackets. .85¢  
All Other Brackets. .85¢  
From Jobbers' Factory, with Freight  
Allowance, except in Eastern dis-  
trict:  
Carloads, Single Strength.  
First Bracket. .85¢  
Second and Third Brackets. .85¢  
All Above. .90¢  
Carloads, Double Strength.  
First Five Brackets. .85¢  
60 inch Bracket. .90¢  
70 to 100 inch Bracket, inclusive.  
All Above. .90¢

**Clue-Liquid, Fish**  
Last A, Bottles or Cans, with Brush.

List B, Cans (1/2 pts., pts., qts.) .37¢@50¢  
List C, Cans (1/2 gal., gal.) .33¢@45¢

**Glue Pots—See Pots, Glue.**

**Grease, Axle—**  
Common Grade. .50¢@6.00  
Dixon's Everlasting. 10-lb pails, ca. 85¢  
Dixon's Everlasting, in bxs. 1 doz. 1 lb.  
\$1.20; 2 lb. \$2.00

**Snow Flake:**  
1 qt. cans, per doz. \$2.00; 2 qt. \$3.20;  
1 gal. cans per doz. \$6.00; 3 gal. \$16.00;  
5 gal. \$24.00

**Crindstone Fixtures—**  
See Fixtures, Crindstone.

**Guards, Snow—**  
Compound Wire Spring Co. .80¢  
Galv. Steel. 1000. \$18.00

**Cun Powder—See Powder.**

**Hack Saws—See Saws,**  
**Hacks, Awi—**

Peg Patent, Leather Top. \$1.00@1.25  
Peg Patent, Plain Top. \$1.00@1.25  
Securing, Brass Ferrule. \$1.00@1.25  
Saddlers', Brass Ferrule. \$1.00@1.25  
Peg, Common. \$1.00@1.25  
Brad, Common. \$1.00@1.25

**Halters and Ties—**

Covert Mfg. Co., Web. .45¢  
Covert Mfg. Co., Jute Rope. .45¢  
Covert Mfg. Co., Sisal Rope. .30¢  
Covert's Saddlery Works, 36 lbs. W-b. .60¢  
Covert's Saddlery Works, Leather 60¢  
Covert's Saddlery Works, Jute. .60¢  
Covert's Saddlery Works, Sisal. .60¢  
Covert's Saddlery Works, Manila. .60¢  
Covert's Saddlery Works, Cotton. .70¢

**Hammers—**  
**Handled Hammers—**

Heller's Machinists'. .50¢@50¢  
Heller's Farmers'. .50¢@50¢  
Magnetite Tack, Nos. 1, 2, 3, \$1.25, \$1.50,  
\$1.75.  
Foss, Stow & Wilcox. .40¢@40¢  
Fayette H. Plumb.  
Plumb, A. E. Nail. .33¢@10¢  
Engineers' and B. S. Hand. .50¢@15¢  
Machinists' Hammers. .50¢@15¢  
Riveting and Liners'. .33¢@10¢  
Sargent's C. S. New List. .40¢@10¢

**Heavy Hammers and**  
**Sledges—**

3 lb. and under. .lb. 15¢  
3 to 5 lb. .lb. 30¢  
Over 5 lb. .lb. 30¢  
Wilkinson's Smiths'. .95¢@1.00

**Handcuffs and Leg Irons**  
See Police Goods.

**Handles—**  
**Agricultural Tool Handles—**

Hoe, Rake, Fork, &c. .60¢@90¢  
Shovel, &c., Wood D Handle. .50¢@50¢  
**Cross-Cut Saw Handles—**

Atkins'. .40¢  
Champion. .45¢@10¢  
Dixson's. .50¢

**Mechanics' Tool Handles—**

Auger, assorted. .gro. \$2.40@3.00  
Auger, large. .gro. \$2.85@3.00  
Brad Aul. .gro. \$1.50@1.75

**Chisel Handles—**

Apple Tanged Firmer, gro. ass'd.  
\$2.50@2.75; large, \$2.50@2.75  
Hickory Tanged Firmer, gro. ass'd.  
\$1.75@2.25; large, \$2.50@2.75  
Apple Socket Firmer, gro. ass'd.  
\$1.75@2.00; large, \$2.00@2.25  
Hickory Socket Firmer, gro. ass'd.  
\$1.60@1.75; large, \$1.75@1.90  
Hickory Socket Framing, gro. ass'd.  
\$2.00@2.25; large, \$2.25@2.50  
File, assorted. .gro. \$1.00@1.15  
Hammer, Hatchet, &c. .80¢  
Hand Saw, Furnished, doz. 75¢  
Not Furnished. .55¢@90¢  
Plane Handles:  
Jack, doz. 25¢; Jack Bolted. .55¢@90¢  
Fore, doz. 35¢; Fore, Bolted. .70¢@75¢

**Hangers—**  
**Barn Door, New Pattern, Round**  
**Groove, Regular:**

Inch. .3 4 5 6 8  
Doz. \$1.10 1.45 1.80 2.10 2.75  
**Barn Door, New England Pattern,**  
**Check Back, Round Groove, Regu-**  
**lar:**  
Inch. .3 4 5 6  
Doz. \$1.50 2.00 2.60 3.25

Chicago Spring Butt Co.:  
Friction. .25¢  
Oscillating. .25¢  
Big Twin. .25¢  
Chisholm & Moore Mfg. Co.:  
Baggage Car Door. .50¢  
Elevator. .40¢  
Railroad. .35¢  
Coleman Hardware Mfg. Co.:  
Czar Ball Bearing. 1/2 doz. pair \$7.50  
No. 10 Roller Bearing. 1/2 doz. pr. 5.50  
No. 20 Roller Bearing. 1/2 doz. pr. 4.50  
Nickel. .30¢  
J. G. C.:  
Crown Hanger Co.:  
1000's Axle. .60¢  
Roller Bearing. .60¢  
Lane Bros.:  
Parlor, Standard. .83¢  
Parlor, New Model. .82¢  
Barn Door, Standard. .83¢  
Covered. .50¢@10¢  
Special. .60¢@10¢  
Lawrence Bros.:  
Advance. .80¢  
Cylinder. .60¢  
Crown. .60¢  
New York. .60¢  
Pe. Press. .60¢  
Sterling. .60¢  
McKinney Mfg. Co.:  
No. 2, Standard. \$18. .60¢  
No. 1, Special. \$18. .60¢  
Stowell Mfg. Co. & Foundry Co.:  
Radger. .60¢  
Baggage Car Door. .33¢  
Chuxx Anti-Friction. .40¢  
Elevator. .40¢  
Interstate. .50¢@10¢  
Magie. .50¢  
Matchless. .50¢@10¢  
Natsen. .50¢@10¢  
Parlor Door. .50¢  
Railroad. .50¢  
Street Car Door. .50¢@10¢  
Steel, Nos. 300, 400, 500. .40¢  
Wild West. .50¢  
Zenith for Wood Track. .50¢@10¢  
Taylor & Boggs Foundry Co.:  
Kiddie's. .50¢@50¢  
Van Wagoner & Williams Hdw. Co.:  
American Trackless. .33¢@10¢  
Wilcox Mfg. Co.:  
Bike Roller Bearing. .60¢@10¢  
C. J. Roller Bearing. .60¢@10¢  
Cyclo Ball Bearing. .50¢  
Dwarf Ball Bearing. .40¢  
Ives, Wood Track. .60¢@10¢  
L. T. Roller Bearing. .60¢@10¢  
New Era Roller Bearing. .50¢  
O. K. Roller Bearing. .60¢@10¢  
Prindle, Wood Track. .50¢  
Richards' Wood Track. .60¢  
Richards' Steel Track. .50¢@10¢  
Spencer Roller Bearing. .60¢@10¢  
Tandem Nos. 1 and 2. .60¢  
Underwriting Roller. .40¢  
Wilcox Auditorium Ball Bearing. .50¢  
Wilcox Barn Trolley No. 123. .40¢  
Wilcox Fire Trolley, Roller  
Bearing. .40¢  
Wilcox Le Roy Noiseless Ball  
Bearing. .40¢  
Wilcox New Centurion. .30¢@10¢  
Wilcox Trolley Ball Bearing. .40¢

**Harness Menders—See**  
**Menders.**

**Harness Snaps—See Snaps.**

**Hooks—**  
**McKinney's Perfect Hasp. 1/2 doz. \$10.00**  
**Wrought Hasps, Staples, &c.—See**  
**Wrought Goods.**

**Hatchets—**

Best Brands. .40¢@10¢  
Cheaper Brands. .50¢@10¢  
Note.—Net prices often made.

**Hay and Straw Knives—**  
See Knives.

**Hinges—**  
**Blind and Shutter Hinges—**

Acme and Dixie Shutter:  
Doz. .1 1/2 2 3 4  
Doz. pair. \$2.45 60 55 47  
Buffalo and Queen City Reversible  
Shutter:  
Doz. .1 1/2 2 3 4  
Doz. pair. \$2.45 60 55 47  
Lull & Porter Old Style Shutter:  
Doz. .1 1/2 2 3 4  
Doz. pair. \$2.45 60 55 47  
1868 Old Pattern Blind Hinge:  
Doz. .1 1/2 2 3 4  
Doz. pair. \$2.45 60 55 47  
Parker. .70¢@75¢  
North's Automatic Blind Fixtures, No.  
2, for Wood, \$9.00; No. 3, for Brick,  
\$11.50  
Reading's Gravity. .75¢@10¢  
Sargent's, Nos. 1, 3, 5. .60¢@10¢  
Sargent's, Nos. 11 & 13. .70¢@10¢  
Wrightsville Hardware Co.:  
Acme, Lull & Porter. .65¢@10¢  
Buffalo Gravity Locking, Nos. 1, 3  
and 5. .65¢@10¢  
Champion Gravity Locking, No. 75. 75¢  
1868 Old Pat'n, Nos. 1, 3 & 5. .75¢  
Tip Pattern, Nos. 1, 3 and 5. .75¢  
Double Locking, Nos. 20 and 25. .70¢  
Empire, Nos. 101 and 103. .65¢@10¢  
Niagara Gravity Locking, Nos. 1, 3  
and 5. .65¢@10¢  
Noiseless, Nos. 56, 60, 65 and 55. .65¢@10¢  
O. S. Lull & Porter. .65¢@10¢  
Pioneer, Nos. 900, 45 and 54. .65¢@10¢  
Steamboat Gravity Locking, No. 10. 75¢  
Stanley's Steel Gravity Blind Hinges,  
1/2 doz. sets \$1.20. .30¢@10¢

**Gate Hinges—**

Clark's or Shepard's—Doz. sets:  
No. .1 2 3  
Hinges with Latches. \$1.90 2.50 4.25

Hinges only. .1.50 1.55 3.30  
Latches only. .0.70 0.70 1.80  
New England:  
With Latch. .doz. \$1.75@1.80  
Without Latch. .doz. \$1.40@1.45  
Reversible Self-Closing:  
With Latch. .doz. \$1.65@1.75  
Without Latch. .doz. \$1.30@1.35  
Western:  
With Latch. .doz. \$1.60@1.65  
Without Latch. .doz. \$1.00@1.05

**Spring Hinges—**  
Holdback, Cast Iron, gro. \$9.00@10.00  
Non-Holdback, Cast Iron,  
gro. \$7.00@8.50

J. Bardsley  
Bardsley's Patent Checking. .15¢  
Bommer Bros.:  
Bommer's. .33¢  
Chicago Spring Butt Co.:  
Chicago. .20¢  
Floor Hinge. .40¢  
Garden City Engine House. .20¢  
Keene's Saloon Door. .20¢  
Triple End. .20¢  
Coleman Hdw. Co.:  
Champion Holdback. 1/2 gr. \$10.00  
J. G. C. .40¢  
Nickel. 1/2 gr. \$9.50  
Lawson Mfg. Co.:  
Matchless. .30¢  
Matchless Pivot. .35¢  
Parson Mfg. Co.:  
Oblique, Dbl. Acting. .50¢@50¢  
Etover Mfg. Co.:  
Ideal, No. 16, Detachable. 1/2 gr. \$12.50  
Ideal, No. 4. 1/2 gr. \$9.00  
New Ideal No. 1. 1/2 gr. \$9.00  
New Ideal, Double Acting. .45¢  
Van Wagoner & Williams Hdw. Co.:  
Acme, rt. Steel. .30¢  
Acme, Brass. .20¢  
American. .30¢  
Columbia, No. 14. 1/2 gr. \$9.00  
Columbia, Adjustable. .30¢  
Gem, new list. .25¢  
Cover Leaf. 1/2 gr. \$12.50  
Oxford new list. .25¢

**Wrought Iron Hinges—**  
Strap and T Hinges, &c., list Mar.  
15, 1898:

Light Strap Hinges. .66¢  
Heavy Strap Hinges. .75¢  
Light T Hinges. .50¢  
Heavy T Hinges. .60¢  
Extra Heavy T Hinges. .66¢  
Hinge Hasps. .45¢  
Cor. Heavy Strap. .70¢  
Cor. Fr. Heavy T. .66¢  
Rolled Plate. .70¢  
Screw Hook. 1/2 to 12 in. .lb. 3 6/34¢  
and Strap. 1/2 to 36 in. .lb. 2 1/2¢  
Screw Hook and Eye:  
1/2 in. .lb. 5 1/2¢  
3/4 in. .lb. 6 1/2¢  
1 in. .lb. 7 1/2¢

**Hoes—Eye—**  
Scovill and Oval Pattern. .60¢@50¢

Grub. list Feb. 23, 1899. .65¢@65¢  
D. & H. Scovill. .33¢

**Handled—**  
Sept. 1, 1901, List:

Field and Garden. .75¢  
Ladies', Boys', Toy and Onion. .70¢  
Street and Mortar. .75¢  
Cotton. .70¢  
Planter. .70¢  
Weeding. .75¢  
Note.—Manufacturers and jobbers use  
a diversity of lists, and often sell at net  
prices  
Ft. Madison Crucible Garden Hoe. .75¢  
Ft. Madison Crescent Cultivator Hoe,  
per doz. .75¢@10¢  
Ft. Madison Mattock Hoes. .75¢@10¢  
Regular Weight. 1/2 doz. \$4.50  
Juni or Size. 1/2 doz. \$4.00  
Ft. Madison Sprouting Hoe. 1/2 doz. \$4.80  
Ft. Madison Dixie Tobacco Hoe. .75¢  
Kestel's Cut Easy, per doz. .75¢  
W. & C. Ivanhoe. .75¢  
B. B. Cultivator Hoe. .75¢  
Acme Weeding. .75¢  
W. & C. Lightning Shovel Hoe, 1/2 doz.  
\$5.50

**Hog Rings and Ringers—**  
See Rings and Ringers.

**Hoisting Apparatus—**  
See Machines, Hoisting.

**Hollow Ware—**  
See Ware, Hollow.

**Holders—**

Angular, 1/2 doz. \$24.00. .45¢@10¢  
**File and Tool—**  
C. E. Jennings & Co. Hold. .33¢  
Nicholson File Holders and File Han-  
dles. .33¢

**Hooks—Cast Iron—**

Bird Cage, Reading. .50¢@10¢  
Bird Cage, Sargent's List. .50¢@10¢  
Clothes Line, Sargent's List. .50¢@10¢  
Clothes Line, Sargent's List. .20¢@10¢  
Clothes Line, Reading List. .70¢  
Clothes Line, Reading List. .65¢@10¢  
Coat and Hat, Stowell's. .70¢  
Coat and Hat, Reading. .70¢  
Coat and Hat, Sargent's List. .35¢  
Coat and Hat, Wrightville. .65¢@10¢  
Harness, Reading List. .70¢@10¢

**Wire—**

Belt. .75¢@75¢  
Atlas Coat and Hat:  
Single Cases. .45¢  
10 Case Lots. .45¢  
Czar Harness. .50¢@10¢  
Wire Coat and Hat:  
Acme. .50¢@10¢  
B. B. .50¢@10¢  
V Brace, Chief and Czar. .50¢@10¢

Gem. .50¢@10¢  
Bright Wire Goods—See Wire.

**Wrought Iron—**  
Box, or Case, Octagon Steel. .doz. \$2.10@2.20

Cotton. .doz. \$1.95@1.15  
Wrought Staples, Hooks, &c.—  
See Wrought Goods.

**Miscellaneous—**

Bush, Light, doz. \$5.50; Medium,  
\$6.00; Heavy, \$6.50  
Grass. .No. 1 1 2 3  
Best. .1.50 1.75 2.00  
Common. .1.10 1.50 1.75  
Potato and Manure. .70¢  
Whiffletree. .lb. 4 1/2¢  
Hooks and Eyes:  
Brass. .60¢@10¢  
Malleable Iron. .70¢@10¢  
Covert Saddlery Works' Self Locking  
Gate and Door Hook. .60¢@10¢  
Crown Picture. .50¢@10¢  
Bench Hooks—See Bench Stops.  
Cord Hooks—See Knives, Cord.

**Horse Nails—See Nails, Horse**  
**Horseshoes—**  
See Shoes, Horse.

**Hose Rubber—**  
Garden Hose, 3/4-inch:

Competition. .ft. 1 1/2 3 4 5 6  
3-ply Standard. .ft. 5 6 6 6 6  
3-ply extra. .ft. 9 6 6 6 6  
4-ply extra. .ft. 11 6 6 6 6  
Cotton Garden, 3/4-in., coupled.  
Low Grade. .ft. 8 6 7 6  
Fair quality. .ft. 8 6 7 6

**Irons—Sad—**

From 1 to 10. .lb. 3 1/2¢  
B. B. Sad Irons. .lb. 3 1/2¢  
Chinese Laundry. .lb. 5 1/2¢  
Chinese Sad. .lb. 3 1/2¢  
Mrs. Potts', per set:  
Nos. 10 55 60 65  
73c 69c 82c 79c  
New England Pressing, lb. 3 1/2¢@3 1/2¢

**Soldering—**  
Soldering Coppers. .lb. 21¢@25¢  
Covert Mfg. Co. .20¢@24¢

**Pinking—**  
Pinking Irons. .doz. 50¢@60¢

**Jack Screws—See Screws,**  
**Jacks, Wagon—**

Covert Mfg. Co., Steel. .45¢@24¢  
Daisy. .70¢  
Lockport. .40¢@40¢  
Victor. .60¢  
Lane's Steel. .40¢

**Kettles—**  
Brass, Spun, Plain. .20¢@25¢  
Enamelled and Cast Iron—See Ware,  
Hollow.

**Knife Sharpeners—**  
See Sharpeners, Knife.

**Knives—**  
**Butcher, Shoe, &c.—**

Dick's Butcher Knives. .40¢  
Foster Bros' Butcher, &c. .30¢  
Nichols' Butcher Knives. .50¢  
Hay and Straw. .See Hay Knives.

**Corn—**

Ft. Madison Cut-Easy, 1/2 doz. .83¢  
Withington Acme, 1/2 doz. \$2.65; Dent,  
\$2.75; d. Serated, \$2.20; Ser-  
ated, \$2.10; Yankee No. 1, \$1.50;  
Yankee No. 2, \$1.15.

**Drawing—**

Standard List. .70¢@50¢  
Adjustable Handle. .35¢@3 1/2¢  
Bradley's. .35¢  
C. E. Jennings & Co. Nos. 45, 46, 40¢@10¢  
Jennings & Griffin. .60¢@50¢  
Swan's. .70¢@10¢  
Watrous. .30¢@10¢  
L. & L. J. White. .20¢@50¢  
Cantale's Folding. .50¢@50¢

**Hay and Straw—**

Blizzard. .85¢@6.00  
Iwan's Sickle Edge. 1/2 doz. \$11.50  
Lightning. .87¢

**Mincing—**

Buffalo. .1/2 doz. \$15.00  
Smith's, 1/2 doz, Single, \$2; Double, \$3  
45¢@50¢

**Miscellaneous—**

Farmers'. .doz. \$2.00@5.00  
Wax entomolm. .1/2 doz. \$3.00@3.25

**Knobs—**  
Base, 2 1/2-inch, Birch, Rubber tip,  
gro. .1.35@1.40

Carriage, Jap. all sizes. .gro. 30¢@35¢  
Door, Mineral. .doz. 68¢@70¢  
Door, Por. Jap d. .doz. 75¢@80¢  
Door, Por. Nickel. .doz. \$2.10@2.20  
Bardsley's Wood Door, Shutter, &c. .15¢  
Picture, Sargent's. .60¢@10¢  
Snow's V. I. for .50¢@10¢

**Ladders Step—**  
Handy Ladder Works:

Length. Height. Shipped. Shipped.  
Feet. Feet. Use Per doz. Per doz.  
4. .7. .16.00. .14.00  
5. .9. .19.50. .17.00  
6. .11. .24.50. .21.00  
7. .13. .34.00. .29.00  
8. .15. .34.00. .29.00  
9. .17. .39.00. .35.00  
10. .19. .43.00. .35.00  
11. .21. .46.50. .40.00  
12. .23. .51.00. .45.00

**Ladies' Melting—**

L. & W. Mfg. Co. .60¢  
P. S. & W. .40¢@10¢  
Reading. .50¢@10¢  
Sargent's. .40¢@10¢

**Lanterns—Tubular—**

Regular Tubular. .doz. \$1.50@5.00  
Side Lift Tubular. .doz. \$1.75@5.25  
Square Lift Tubular. .doz. \$1.75@5.25  
Other Styles. .lb. \$1.00@10¢



**Bull's Eye Pollice—**  
 3/4-inch flash light... doz. \$5.50@5.75  
 5/8-inch flash light... doz. \$5.00@5.25  
 3/4-inch regular... doz. \$5.25@5.50  
 5-inch regular... doz. \$5.50@5.75

**Latches, Thumb—**  
 Roggin's Latches... doz. \$2@3.00

**Lawn Mowers—**  
 See Mowers, Lawn.

**Leaders, Cattle—**  
 Small... doz. 15c; large, 55c  
 Covert Mfg. Co. 45c@50c

**Lemon Squeezers—**  
 See Squeezers, Lemon.

**Lifters, Transom—**  
 Dickson's  
 3 x 4 ft. x 1/2" ... \$1.00 \$1.10  
 Other sizes, Iron ... 70c@1.00  
 Other size, Brass and Bronze ... 70c  
 Excelsior ... 60c@80c@1.00  
 Payson's  
 Solid Grip Nos. 643 and 644, 1.00  
 Bronzed Iron ... 70c

**Lines—**  
 Wire Clothes, Nos. 18 19 20  
 100 feet ... \$2.50 2.50 1.95  
 75 feet ... \$2.15 1.90 1.55

**Ossawau Mills.**  
 Crown Solid Braided Chalk ... 33c@40c  
 Mason's, No. 0 to No. 5 ... 33c@40c  
 Samson Cordage Works  
 Solid Braided Chalk, No. 0 to 3 ... 40c  
 Silver Lake Braided Chalk, No. 0, \$6.00;  
 No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50  
 1/2 gr. ... 30c

**Locks, &c.— Cabinet—**  
 Cabinet Locks ... 33c@35c@40c@45c  
 [Net prices are very often made on these goods.]

**Door Locks, Latches, &c.—**  
 Reading Hardware Co. ... 40c  
 R. & E. Mfg. Co. ... 50c  
 Sargent & Co. ... 40c@45c@50c  
 Slaymaker-Barry Co. ... 30c@35c  
 Snow's Victor ... 50c@1.00

**Elevator—**  
 Stowell's ... 83c@85c

**Padlocks—**  
 Wrought Iron, list Dec. 8, '97 ... 70c@75c@1.00

**Dog Collar, B. B. Co. ... 40c**  
**R. & E. Mfg. Co. Wrt. Steel and Brass ... 50c**  
**B. B. & Co. ... 40c**

**Sash, &c.—**  
 Fitch's Bronze and Brass ... 60c@65c  
 Fitch's Iron ... 70c  
 Ives' Patent ... 55c@55c@55c  
 Oeffinger's Automatic ... 50c  
 Payson's Perfect ... 70c  
 Payson's Signal (new list) ... 75c  
 Reading ... 60c@1.00@1.00@1.00

**Machines—**  
**Boring—**  
 Without Augers.  
 Upright, Angular.  
 Improved No. 3 ... \$4.25 No. 1 \$5.00  
 Improved No. 4 ... 3.75 No. 2 3.38  
 Improved No. 5 ... 2.75  
 Jennings' ... 2.50 3.00  
 Millers' Falls ... 6.75  
 Snell's, Rice's Pat. ... 2.50 2.75  
 Swan's, No. 500 ... 1.50 No. 200 6.45

**Holting—**  
 Moore's Anti-Friction Differential Pulley Block ... 30c  
 Moore's Hand Holst, with Lock Brake ... 30c

**Ice Cutting—**  
 Chandler's ... 15c

**Washing—**  
 Wayne American, 1/2 doz. \$38.00  
 Western Star, No. 2, 1/2 doz. 28.00  
 Western Star, No. 3, 1/2 doz. 30.00  
 St. Louis, No. 41, 1/2 doz. 60.00

**Mallets—**  
 Hickory ... 45c@50c@55c  
 Lignumvite ... 45c@50c@55c  
 Tinnars', Hickory and Applewood, doz. 50c@55c  
 Fiber Head Stearns' ... 30c@1.00

**Mats—**  
**Door—**  
 Elastic Steel (W. G. Co.) ... 10c

**Mattocks—**  
 See Picks and Mattocks.

**Meat Cutters—**  
 See Cutters, Meat.

**Milk Cans—** See Cans, Milk.

**Mills—** Coffee—  
 Box and Side, list Jan. 1, '88 ... 50c@1.00@1.00@1.00  
 Net prices are often made on some goods which are lower than above discounts.

**Entorprise Mfg. Co. ... 25c@30c**  
**National, list Jan. 1, '04 ... 30c**  
**Parker's Columbia and Victoria ... 30c**

**Parker's Box and Side ... 50c@1.00@1.00**  
**Swift, Lane Bros. ... 50c@1.00@1.00**

**Mincing Knives—**  
 See Knives, Mincing.

**Molasses Cates—**  
 See Gates, Molasses.

**Money Drawers—**  
 See Drawers, Money.

**Mowers, Lawn—**  
 Net prices are generally quoted.

**Cheap ... all sizes, \$3.00**  
**Good ... all sizes, \$2.50@2.75**  
 10 12 14 16-inch  
**High Grade 1 1/2 2 1/2 3 1/2 4 1/2 5 1/2 6 1/2 7 1/2 8 1/2 9 1/2 10 1/2 11 1/2 12 1/2 13 1/2 14 1/2 15 1/2 16 1/2 17 1/2 18 1/2 19 1/2 20 1/2 21 1/2 22 1/2 23 1/2 24 1/2 25 1/2 26 1/2 27 1/2 28 1/2 29 1/2 30 1/2 31 1/2 32 1/2 33 1/2 34 1/2 35 1/2 36 1/2 37 1/2 38 1/2 39 1/2 40 1/2 41 1/2 42 1/2 43 1/2 44 1/2 45 1/2 46 1/2 47 1/2 48 1/2 49 1/2 50 1/2 51 1/2 52 1/2 53 1/2 54 1/2 55 1/2 56 1/2 57 1/2 58 1/2 59 1/2 60 1/2 61 1/2 62 1/2 63 1/2 64 1/2 65 1/2 66 1/2 67 1/2 68 1/2 69 1/2 70 1/2 71 1/2 72 1/2 73 1/2 74 1/2 75 1/2 76 1/2 77 1/2 78 1/2 79 1/2 80 1/2 81 1/2 82 1/2 83 1/2 84 1/2 85 1/2 86 1/2 87 1/2 88 1/2 89 1/2 90 1/2 91 1/2 92 1/2 93 1/2 94 1/2 95 1/2 96 1/2 97 1/2 98 1/2 99 1/2 100 1/2 101 1/2 102 1/2 103 1/2 104 1/2 105 1/2 106 1/2 107 1/2 108 1/2 109 1/2 110 1/2 111 1/2 112 1/2 113 1/2 114 1/2 115 1/2 116 1/2 117 1/2 118 1/2 119 1/2 120 1/2 121 1/2 122 1/2 123 1/2 124 1/2 125 1/2 126 1/2 127 1/2 128 1/2 129 1/2 130 1/2 131 1/2 132 1/2 133 1/2 134 1/2 135 1/2 136 1/2 137 1/2 138 1/2 139 1/2 140 1/2 141 1/2 142 1/2 143 1/2 144 1/2 145 1/2 146 1/2 147 1/2 148 1/2 149 1/2 150 1/2 151 1/2 152 1/2 153 1/2 154 1/2 155 1/2 156 1/2 157 1/2 158 1/2 159 1/2 160 1/2 161 1/2 162 1/2 163 1/2 164 1/2 165 1/2 166 1/2 167 1/2 168 1/2 169 1/2 170 1/2 171 1/2 172 1/2 173 1/2 174 1/2 175 1/2 176 1/2 177 1/2 178 1/2 179 1/2 180 1/2 181 1/2 182 1/2 183 1/2 184 1/2 185 1/2 186 1/2 187 1/2 188 1/2 189 1/2 190 1/2 191 1/2 192 1/2 193 1/2 194 1/2 195 1/2 196 1/2 197 1/2 198 1/2 199 1/2 200 1/2 201 1/2 202 1/2 203 1/2 204 1/2 205 1/2 206 1/2 207 1/2 208 1/2 209 1/2 210 1/2 211 1/2 212 1/2 213 1/2 214 1/2 215 1/2 216 1/2 217 1/2 218 1/2 219 1/2 220 1/2 221 1/2 222 1/2 223 1/2 224 1/2 225 1/2 226 1/2 227 1/2 228 1/2 229 1/2 230 1/2 231 1/2 232 1/2 233 1/2 234 1/2 235 1/2 236 1/2 237 1/2 238 1/2 239 1/2 240 1/2 241 1/2 242 1/2 243 1/2 244 1/2 245 1/2 246 1/2 247 1/2 248 1/2 249 1/2 250 1/2 251 1/2 252 1/2 253 1/2 254 1/2 255 1/2 256 1/2 257 1/2 258 1/2 259 1/2 260 1/2 261 1/2 262 1/2 263 1/2 264 1/2 265 1/2 266 1/2 267 1/2 268 1/2 269 1/2 270 1/2 271 1/2 272 1/2 273 1/2 274 1/2 275 1/2 276 1/2 277 1/2 278 1/2 279 1/2 280 1/2 281 1/2 282 1/2 283 1/2 284 1/2 285 1/2 286 1/2 287 1/2 288 1/2 289 1/2 290 1/2 291 1/2 292 1/2 293 1/2 294 1/2 295 1/2 296 1/2 297 1/2 298 1/2 299 1/2 300 1/2 301 1/2 302 1/2 303 1/2 304 1/2 305 1/2 306 1/2 307 1/2 308 1/2 309 1/2 310 1/2 311 1/2 312 1/2 313 1/2 314 1/2 315 1/2 316 1/2 317 1/2 318 1/2 319 1/2 320 1/2 321 1/2 322 1/2 323 1/2 324 1/2 325 1/2 326 1/2 327 1/2 328 1/2 329 1/2 330 1/2 331 1/2 332 1/2 333 1/2 334 1/2 335 1/2 336 1/2 337 1/2 338 1/2 339 1/2 340 1/2 341 1/2 342 1/2 343 1/2 344 1/2 345 1/2 346 1/2 347 1/2 348 1/2 349 1/2 350 1/2 351 1/2 352 1/2 353 1/2 354 1/2 355 1/2 356 1/2 357 1/2 358 1/2 359 1/2 360 1/2 361 1/2 362 1/2 363 1/2 364 1/2 365 1/2 366 1/2 367 1/2 368 1/2 369 1/2 370 1/2 371 1/2 372 1/2 373 1/2 374 1/2 375 1/2 376 1/2 377 1/2 378 1/2 379 1/2 380 1/2 381 1/2 382 1/2 383 1/2 384 1/2 385 1/2 386 1/2 387 1/2 388 1/2 389 1/2 390 1/2 391 1/2 392 1/2 393 1/2 394 1/2 395 1/2 396 1/2 397 1/2 398 1/2 399 1/2 400 1/2 401 1/2 402 1/2 403 1/2 404 1/2 405 1/2 406 1/2 407 1/2 408 1/2 409 1/2 410 1/2 411 1/2 412 1/2 413 1/2 414 1/2 415 1/2 416 1/2 417 1/2 418 1/2 419 1/2 420 1/2 421 1/2 422 1/2 423 1/2 424 1/2 425 1/2 426 1/2 427 1/2 428 1/2 429 1/2 430 1/2 431 1/2 432 1/2 433 1/2 434 1/2 435 1/2 436 1/2 437 1/2 438 1/2 439 1/2 440 1/2 441 1/2 442 1/2 443 1/2 444 1/2 445 1/2 446 1/2 447 1/2 448 1/2 449 1/2 450 1/2 451 1/2 452 1/2 453 1/2 454 1/2 455 1/2 456 1/2 457 1/2 458 1/2 459 1/2 460 1/2 461 1/2 462 1/2 463 1/2 464 1/2 465 1/2 466 1/2 467 1/2 468 1/2 469 1/2 470 1/2 471 1/2 472 1/2 473 1/2 474 1/2 475 1/2 476 1/2 477 1/2 478 1/2 479 1/2 480 1/2 481 1/2 482 1/2 483 1/2 484 1/2 485 1/2 486 1/2 487 1/2 488 1/2 489 1/2 490 1/2 491 1/2 492 1/2 493 1/2 494 1/2 495 1/2 496 1/2 497 1/2 498 1/2 499 1/2 500 1/2 501 1/2 502 1/2 503 1/2 504 1/2 505 1/2 506 1/2 507 1/2 508 1/2 509 1/2 510 1/2 511 1/2 512 1/2 513 1/2 514 1/2 515 1/2 516 1/2 517 1/2 518 1/2 519 1/2 520 1/2 521 1/2 522 1/2 523 1/2 524 1/2 525 1/2 526 1/2 527 1/2 528 1/2 529 1/2 530 1/2 531 1/2 532 1/2 533 1/2 534 1/2 535 1/2 536 1/2 537 1/2 538 1/2 539 1/2 540 1/2 541 1/2 542 1/2 543 1/2 544 1/2 545 1/2 546 1/2 547 1/2 548 1/2 549 1/2 550 1/2 551 1/2 552 1/2 553 1/2 554 1/2 555 1/2 556 1/2 557 1/2 558 1/2 559 1/2 560 1/2 561 1/2 562 1/2 563 1/2 564 1/2 565 1/2 566 1/2 567 1/2 568 1/2 569 1/2 570 1/2 571 1/2 572 1/2 573 1/2 574 1/2 575 1/2 576 1/2 577 1/2 578 1/2 579 1/2 580 1/2 581 1/2 582 1/2 583 1/2 584 1/2 585 1/2 586 1/2 587 1/2 588 1/2 589 1/2 590 1/2 591 1/2 592 1/2 593 1/2 594 1/2 595 1/2 596 1/2 597 1/2 598 1/2 599 1/2 600 1/2 601 1/2 602 1/2 603 1/2 604 1/2 605 1/2 606 1/2 607 1/2 608 1/2 609 1/2 610 1/2 611 1/2 612 1/2 613 1/2 614 1/2 615 1/2 616 1/2 617 1/2 618 1/2 619 1/2 620 1/2 621 1/2 622 1/2 623 1/2 624 1/2 625 1/2 626 1/2 627 1/2 628 1/2 629 1/2 630 1/2 631 1/2 632 1/2 633 1/2 634 1/2 635 1/2 636 1/2 637 1/2 638 1/2 639 1/2 640 1/2 641 1/2 642 1/2 643 1/2 644 1/2 645 1/2 646 1/2 647 1/2 648 1/2 649 1/2 650 1/2 651 1/2 652 1/2 653 1/2 654 1/2 655 1/2 656 1/2 657 1/2 658 1/2 659 1/2 660 1/2 661 1/2 662 1/2 663 1/2 664 1/2 665 1/2 666 1/2 667 1/2 668 1/2 669 1/2 670 1/2 671 1/2 672 1/2 673 1/2 674 1/2 675 1/2 676 1/2 677 1/2 678 1/2 679 1/2 680 1/2 681 1/2 682 1/2 683 1/2 684 1/2 685 1/2 686 1/2 687 1/2 688 1/2 689 1/2 690 1/2 691 1/2 692 1/2 693 1/2 694 1/2 695 1/2 696 1/2 697 1/2 698 1/2 699 1/2 700 1/2 701 1/2 702 1/2 703 1/2 704 1/2 705 1/2 706 1/2 707 1/2 708 1/2 709 1/2 710 1/2 711 1/2 712 1/2 713 1/2 714 1/2 715 1/2 716 1/2 717 1/2 718 1/2 719 1/2 720 1/2 721 1/2 722 1/2 723 1/2 724 1/2 725 1/2 726 1/2 727 1/2 728 1/2 729 1/2 730 1/2 731 1/2 732 1/2 733 1/2 734 1/2 735 1/2 736 1/2 737 1/2 738 1/2 739 1/2 740 1/2 741 1/2 742 1/2 743 1/2 744 1/2 745 1/2 746 1/2 747 1/2 748 1/2 749 1/2 750 1/2 751 1/2 752 1/2 753 1/2 754 1/2 755 1/2 756 1/2 757 1/2 758 1/2 759 1/2 760 1/2 761 1/2 762 1/2 763 1/2 764 1/2 765 1/2 766 1/2 767 1/2 768 1/2 769 1/2 770 1/2 771 1/2 772 1/2 773 1/2 774 1/2 775 1/2 776 1/2 777 1/2 778 1/2 779 1/2 780 1/2 781 1/2 782 1/2 783 1/2 784 1/2 785 1/2 786 1/2 787 1/2 788 1/2 789 1/2 790 1/2 791 1/2 792 1/2 793 1/2 794 1/2 795 1/2 796 1/2 797 1/2 798 1/2 799 1/2 800 1/2 801 1/2 802 1/2 803 1/2 804 1/2 805 1/2 806 1/2 807 1/2 808 1/2 809 1/2 810 1/2 811 1/2 812 1/2 813 1/2 814 1/2 815 1/2 816 1/2 817 1/2 818 1/2 819 1/2 820 1/2 821 1/2 822 1/2 823 1/2 824 1/2 825 1/2 826 1/2 827 1/2 828 1/2 829 1/2 830 1/2 831 1/2 832 1/2 833 1/2 834 1/2 835 1/2 836 1/2 837 1/2 838 1/2 839 1/2 840 1/2 841 1/2 842 1/2 843 1/2 844 1/2 845 1/2 846 1/2 847 1/2 848 1/2 849 1/2 850 1/2 851 1/2 852 1/2 853 1/2 854 1/2 855 1/2 856 1/2 857 1/2 858 1/2 859 1/2 860 1/2 861 1/2 862 1/2 863 1/2 864 1/2 865 1/2 866 1/2 867 1/2 868 1/2 869 1/2 870 1/2 871 1/2 872 1/2 873 1/2 874 1/2 875 1/2 876 1/2 877 1/2 878 1/2 879 1/2 880 1/2 881 1/2 882 1/2 883 1/2 884 1/2 885 1/2 886 1/2 887 1/2 888 1/2 889 1/2 890 1/2 891 1/2 892 1/2 893 1/2 894 1/2 895 1/2 896 1/2 897 1/2 898 1/2 899 1/2 900 1/2 901 1/2 902 1/2 903 1/2 904 1/2 905 1/2 906 1/2 907 1/2 908 1/2 909 1/2 910 1/2 911 1/2 912 1/2 913 1/2 914 1/2 915 1/2 916 1/2 917 1/2 918 1/2 919 1/2 920 1/2 921 1/2 922 1/2 923 1/2 924 1/2 925 1/2 926 1/2 927 1/2 928 1/2 929 1/2 930 1/2 931 1/2 932 1/2 933 1/2 934 1/2 935 1/2 936 1/2 937 1/2 938 1/2 939 1/2 940 1/2 941 1/2 942 1/2 943 1/2 944 1/2 945 1/2 946 1/2 947 1/2 948 1/2 949 1/2 950 1/2 951 1/2 952 1/2 953 1/2 954 1/2 955 1/2 956 1/2 957 1/2 958 1/2 959 1/2 960 1/2 961 1/2 962 1/2 963 1/2 964 1/2 965 1/2 966 1/2 967 1/2 968 1/2 969 1/2 970 1/2 971 1/2 972 1/2 973 1/2 974 1/2 975 1/2 976 1/2 977 1/2 978 1/2 979 1/2 980 1/2 981 1/2 982 1/2 983 1/2 984 1/2 985 1/2 986 1/2 987 1/2 988 1/2 989 1/2 990 1/2 991 1/2 992 1/2 993 1/2 994 1/2 995 1/2 996 1/2 997 1/2 998 1/2 999 1/2 1000 1/2**

**Philadelphia:**  
 Styles M. S. C. K. T. ... 70c@1.00  
 Style A, all Steel ... 60c@1.00  
 Style E, Low Wheel ... 60c@1.00  
 Style E, High Wheel ... 60c@1.00  
 Drexel and Gold Coin, low list ... 50c

**Nails—**  
 Cut and Wire. See Trade Report.  
 Wire Nail and Brads, Papered.  
 List July 30, 1899 ... 85c@50c@1.00  
 Hungarian. Finishing, Upholster-  
 ers', &c. See Tacks.

**Horse—**  
 Nos. 6 7 8 9 10  
 A. C. ... 25c 25c 25c 25c 25c  
 Capewell ... 19c 18c 17c 16c 16c@10c@5c  
 C. B. K. ... 25c 25c 25c 25c 25c  
 Champlain ... 25c 25c 25c 25c 25c  
 Maud S. ... 25c 25c 25c 25c 25c  
 Nenonset ... 25c 25c 25c 25c 25c  
 Putnam ... 25c 25c 25c 25c 25c  
 Standard ... 25c 25c 25c 25c 25c  
 Star ... 25c 25c 25c 25c 25c  
 Vulcan ... 25c 25c 25c 25c 25c

**Picture**  
 1 1/2 2 2 1/2 3 3 1/2 in.  
 Brass Head, 1 1/2 1 1/2 1 1/2 1 1/2 1 1/2 gro.  
 Por. Head, 1 1/2 1 1/2 1 1/2 1 1/2 1 1/2 gro.

**Nippers, See Pliers and Nippers.**

**Nut Crackers—**  
 See Crackers, Nut.

**Nuts—**  
 List Feb. 1, '99.  
 Cold Punched  
 Mfrs. or U. S. Standard. list.  
 Hexagon, plain ... 4.40@4.50c  
 Square, plain ... 4.30@4.40c  
 Square, C. T. & R. ... 4.70@4.80c  
 Hexagon, C. T. & R. ... 4.70@4.80c  
 Hot Pressed:  
 Mfrs. U. S. or Nar. Gauge Stan'd.  
 Square ... 5.20@5.30c  
 Hexagon ... 5.20@5.30c  
 NOTE.—Tapped Nuts are now 2-10c.  
 higher than above.

**Oakum—**  
 Best or Government ... lb. 6 1/2c  
 Navy ... lb. 5 c  
 U. S. Navy ... lb. 6 1/2c  
 Plumbers' Spun Navy ... 3 c  
 In carload lots 1/4c lb. off f.o.b. New York.

**Oil, Axle—**  
 Snow Flake:  
 1 pt. cans, per doz. ... \$3.00  
 1 qt. cans, per doz. ... \$4.80  
 1 gal. cans, per doz. ... \$15.00  
 5 gal. cans, per doz. ... \$68

after shaded by jobbers \$0.50 @ 1.00



**Shovels and Tongs—**

Brass Head ..... 60¢50¢60¢10¢  
 Iron Head ..... 60¢50¢60¢10¢

**Sieves and Sifters—**

Hunter's Imitation, gro. \$11.00 to \$12.00  
 Buffalo Metallic Blue, S. S. & Co., gr. gr. 14 1/2 18 18 20 18 20 18 20  
 \$12.90 \$13.80 \$15.00  
 Eclipse ..... gr. \$10.00  
 Electric Light ..... gr. \$12.00  
 Hunter's Genuine ..... gr. \$12.50  
 Shaker (Barber's Pat.) Flour Sifters, 4 doz., \$2.00 ..... 30¢

**Sieves, Wooden Rim—**

Nested, 10, 11 and 12 Inch.  
 Mesh 18, Nested, doz. .... \$0.75 to \$0.87  
 Mesh 20, Nested, doz. .... 85¢ to 99¢  
 Mesh 24, Nested, doz. .... 1.00 to 1.05

**Sinks—****Cast Iron—**

Standard list ..... 60¢ to 60¢10¢  
 Note:—There is not entire uniformity in lists used by jobbers.

**Wrought Steel—**

Columbus Galv'd and Enamelled, 60¢5¢  
 Columbia, Painted ..... 45¢  
 L. & G. Mfg. Co., Galvanized ..... 50¢  
 L. & G. Mfg. Co., Enamelled ..... 50¢

**Skins, Wagon—**

Cast Iron ..... 70¢ to 10¢75¢  
 Malleable Iron ..... 10¢ to 10¢50¢  
 Steel ..... 35¢ to 40¢

**Slates—**

"D" Slates ..... 50¢ to 10¢50¢10¢10¢  
 Unexcelled Noiseless Slates, 60¢ to 10¢50¢10¢5¢  
 Wire Bound ..... 10¢ to 10¢50¢  
 Double Slates, add \$1 case, net.

**Slaw Cutters—See Cutters.****Slicers, Vegetable—**

Sterling \$2.00 ..... 33¢5¢

**Snaps, Harness—**

German ..... 40¢ to 40¢10¢  
 Covert Mfg. Co.:  
 Derby ..... 35¢ to 35¢  
 High Grade ..... 45¢ to 45¢  
 Jockey ..... 45¢ to 45¢  
 Trojan ..... 45¢ to 45¢

**Covert's Saddlery Works:**

Banner ..... 60¢ to 10¢  
 Crown ..... 60¢ to 10¢  
 Triumph ..... 60¢ to 10¢

**W. & E. T. Fitch Co.:**

Bristol ..... 40¢ to 10¢  
 Empire ..... 50¢ to 5¢  
 German ..... 40¢  
 National ..... 50¢ to 5¢  
 Perfect ..... 45¢  
 Clipper ..... 50¢ to 5¢  
 Champion ..... 40¢  
 Security ..... 40¢  
 Victor ..... 60¢ to 5¢

**Oneda Community:**

Solid Steel ..... 65¢ to 65¢10¢  
 Solid Steel ..... 65¢ to 65¢10¢10¢  
 Sargent's Patent Guarded ..... 60¢ to 10¢

**Snaths—**

Scythe ..... 45¢ to 5¢

**Snips, Tinner's—See Shears.****Soldering Irons—**

See Irons, Soldering.

**Spoke Trimmers—**

See Trimmers, Spoke.

**Spoons and Forks—**

Silver Plated—

Flat Ware ..... 50¢ to 10¢60¢10¢  
 Wm. Rogers Mfg. Co. .... 30¢ to 10¢

**Miscellaneous—**

German Silver ..... 60¢ to 10¢  
 Wm. Rogers Mfg. Co.:  
 18 German Silver ..... 60¢  
 Rogers' Silver Metal ..... 50¢ to 10¢

**Springs—****Door—**

Gem (Coll.) ..... 20¢  
 Star (Coll.) ..... 30¢  
 Torrey's Rod, 39 in., 4 doz. \$1.10 to \$1.25  
 Warner's No. 2, 4 doz. \$2.50; No. 3, \$3.00  
 Victor (Coll.) ..... 50¢ to 10¢10¢

**Carriage, Wagon, &c.**

Factory Shipments.  
 1 1/4 in. and wider ..... Blk. Hf. Brl. Brl. 4 1/4 4 1/2 4 3/4 4 1/2  
 Cliff's Bolster Springs ..... 35¢  
 Cliff's Seat Springs ..... pair 55¢

**Sprinklers, Lawn—**

Enterprise ..... 25¢ to 30¢  
 Philadelphia No. 1, 4 doz. \$12; No. 2, \$15; No. 3, \$18

**Squares—**

Nickel plated, List Jan. 5, 1901  
 Steel and Iron, 70¢ to 10¢  
 Rosewood Hdl. Try Square and T-Bevels ..... 60¢ to 10¢10¢70¢  
 Iron Hdl. Try Square and T-Bevels ..... 40¢ to 10¢40¢10¢10¢

Miston's Try Square and T-Bevel ..... 60¢ to 10¢  
 Winterbottom's Try and Miter ..... 55¢ to 10¢

**Squeezers—****Lemon—**

Wood, Common, gro., No. 2, 25¢ to 50¢; No. 1, 85¢ to \$6.50  
 Wood, Porcelain Lined:  
 Cheap ..... doz. \$1.60 to \$2.75  
 Good Grade ..... doz. \$3.00 to \$5.50

Tinned Iron ..... doz. \$0.75 to \$1.25  
 Iron, Porcelain Lined doz. \$2.90 to \$3.25  
 Jennings' Star ..... doz. \$1.85 to \$1.90  
 King ..... doz. \$2.00

**Staples—**

Barbed Blind ..... lb. 84¢ to 84¢  
 Electricians', Association list, 7-10¢  
 Fence Staples, same price as Barbed Wire. See Trade Report.  
 Poultry Netting, Staples, per lb. 5¢.  
 Grand Crossing Tack Co.'s list ..... 80¢ to 10¢

**Steels, Butchers'—**

Dick's ..... 40¢  
 Foster Bros. .... 30¢  
 C. & A. Hoffmann's ..... 40¢  
 Nichols Bros. .... 50¢

**Steelyards—**

Blacksmiths' ..... 40¢ to 40¢10¢

Gardner Die Works No. 1 ..... 50¢  
 Gardner Die Stocks, larger sizes ..... 40¢  
 Green River ..... 25¢  
 Lightning Screw Plate ..... 25¢  
 Little Giant ..... 25¢  
 Revere's New Screw Plates ..... 25¢ to 30¢  
 Curtis Reversible Ratchet Die Stock ..... 25¢

**Stone—****Scythe Stones—**

Chicago Wheel & Mfg. Co.:  
 Gem Corundum, 10 inch, \$10.80 per gro., 12 inch, \$12.00  
 Cleveland Stone Co., list Nov. '92, 33¢ to 35¢  
 Pike Mfg. Co., list '95-'96 ..... 33¢ to 35¢

**Oil Stones, &c.**

Chicago Wheel & Mfg. Co.:  
 Corundum Oil, Double Grit ..... 50¢  
 Corundum Oil, Single Grit ..... 35¢  
 Pike Mfg. Co.:  
 Hindostan No. 1, 4 doz. 8¢  
 Sand Stone ..... 33¢ to 35¢  
 Turkey Oil Stone, Extra, 5 to 3 in. Slips ..... 33¢ to 40¢  
 Turkey Slips ..... \$1.50

Lily White Washita ..... 60¢  
 Rosy Red Washita ..... 60¢  
 Washita Stone, Extra ..... 50¢  
 Washita Stone, No. 1 ..... 40¢  
 Washita Stone, No. 2 ..... 30¢  
 Lily White Slips ..... 90¢  
 Rosy Red Slips ..... 90¢  
 Washita Slips, Extra ..... 80¢  
 Washita Slips, No. 1 ..... 70¢  
 Arkansas Stone, No. 1, 3 to 5 in. \$2.50  
 Arkansas Stone, No. 1, 5 to 8 in. \$3.50

India Oil Stones ..... 25¢  
 Tanite Mills:  
 Emery Oil, 4 doz. \$5.00 ..... 50¢ to 60¢

**Stoners—****Cherry—**

Enterprise ..... 25¢ to 30¢

**Stops, Bench—**

Millers Falls ..... 15¢ to 10¢  
 Morrill's, 4 doz., No. 1, \$10.00; No. 2, \$11.00, 40¢ to 20¢

**Stops, Window—**

Ives' Patent ..... 25¢ to 5¢  
 Wilcox, Steel, per doz. \$4.00 ..... 50¢

**Stove Boards—****See Boards, Stove.****Stove Polish—See Polish, Stove.****Strainers, Pump—**

Diamond Joe Pump Strainers, per doz. 75¢

**Straps, Box—**

Cary's Universal case lots ..... 20¢ to 10¢

**Stretchers, Carpet—**

Cast Iron, Steel Points ..... doz. 55¢ to 65¢  
 Cast Steel, Polished ..... doz. \$2.25  
 Socket ..... doz. \$1.75

**Stuffers, Sausage—**

Miles' Challenge, 4 doz. \$30.00 to 50¢ to 5¢  
 Enterprise Mfg. Co. .... 25¢ to 25¢75¢  
 National Specialty Mfg. Co., list Jan. 1, '97 ..... 30¢

**Tacks Brads, &c.—**

See Trade Report.  
 List Jan. 15, '99.  
 Carpet Tacks, American ..... 90¢ to 40¢  
 American Cut Tacks ..... 90¢ to 30¢  
 Swedish Iron Tacks ..... 90¢ to 40¢  
 Swedish Upholsterers' Tacks ..... 90¢ to 40¢

Gimp Tacks ..... 90¢ to 40¢  
 Lace Tacks ..... 90¢ to 40¢  
 Trimmers' Tacks ..... 90¢ to 30¢  
 Looking Glass Tacks ..... 70¢ to 10¢  
 Bill Posters' and Railroad Tack ..... 70¢ to 10¢  
 Hungarian Nails ..... 80¢ to 45¢  
 Common and Patent Brads, 70¢ to 10¢  
 Trunk and Clout Nails ..... 80¢ to 10¢

NOTE:—The above prices are for straight weights. An extra 5% is given Star Weights and an extra 10% on Standard Weights.

**Miscellaneous—**

Double Point Tacks, 30¢ to 7 or 8 tens  
 Steel Wire Brads, R. & E. Mfg. Co.'s list ..... 50¢ to 10¢ to 60¢  
 See also Nails, Wire.

**Tanks, Oil—**

Emerald, S. S. & Co. .... 30-gal. \$3.20  
 Emerald, S. S. & Co. .... 50-gal. \$4.00  
 Queen City S. S. & Co., 10-gal. .... \$3.50  
 Queen City S. S. & Co., 60-gal. .... \$4.25

**Tapes, Measuring—**

American Asses' Skin ..... 40¢ to 10¢ to 50¢  
 Patent Leather ..... 25¢ to 30¢ to 5¢  
 Steel ..... 40¢ to 10¢ to 5¢  
 Chesterman's ..... 25¢ to 5¢ to 5¢

Eddy's Steel ..... 40¢ to 40¢5¢  
 Eddy's Metallic ..... 33¢ to 33¢5¢  
 Keuffel & Esser Co., Steel and Metallic, Lower list, 1899 ..... 35¢  
 Lufkin's Steel ..... 33¢ to 35¢  
 Lufkin's Metallic ..... 30¢ to 30¢5¢

**Thermometers—**

Tin Case ..... 80¢ to 80¢10¢

**Ties, Bale—Steel.**

Standard Wire ..... 50¢ to 10¢5¢

**Ties, Wall—**

Cleveland Wire Spring Co.:  
 Galv. St. el 5 3/2 x 8 1/4 in. # 1000 \$10.00  
 Galv. Steel 5 3/2 x 8 1/4 in. # 1000 \$11.00  
 Galv. Steel 5 3/2 x 11 1/4 in. # 1000 \$12.00  
 Galv. Steel 5 3/2 x 15 1/4 in. # 1000 \$14.00

**Tinner's Shears, &c.—**

See Shears, Tinner's, &c.

**Tinware—**

Stamped, Japanned and Placed, sold very generally at net prices.

**Tire Benders, Upsetters, &c.—See Benders and Upsetters, Tire****Tobacco Cutters—**

See Cutters, Tobacco.

**Tools—**

Coopers'—

L. & J. White ..... 20¢ to 20¢5¢

**Saw—**

Atkins' new list ..... 40¢  
 Simonds' Improved ..... 33¢ to 25¢  
 Simonds' Crescent ..... 25¢

**Ship—**

L. & J. White ..... 25¢

**Transom Lifters—**

See Lifters, Transom.

**Traps—Game—**

Oneda Pattern ..... 70¢ to 10¢75¢10¢  
 Newhouse ..... 45¢ to 50¢  
 Hawley & Norton ..... 65¢ to 70¢  
 Victor (Oneda Pattern) ..... 75¢ to 75¢10¢  
 Star (Blake Pattern) ..... 65¢ to 10¢70¢5¢

**Mouse and Rat—**

Mouse, Wood, Choker, doz. holes 9¢ to 9¢c  
 Mouse, Round or Square Wire ..... doz. \$0.85 to 1.90  
 Diamond Joe Mouse Traps, per doz. 60¢  
 Diamond Joe Rat Traps, per doz. \$1.00  
 Marty French Rat and Mouse Traps (Genuine):  
 No. 1, Rat, 4 doz. \$12.00; case of 24 \$10.50  
 No. 3, Rat, 4 doz. \$5.50; case of 50 \$5.00  
 No. 3 1/2, Rat, 4 doz. \$1.50; case of 72 \$2.00  
 No. 4, Mouse, 4 doz. \$3.50; case of 72 \$2.75  
 No. 5, Mouse, 4 doz. \$2.75; case of 150 \$2.25  
 Schuyler's Rat Killer, No. 1, 4 gr. \$30.00; No. 2, 4 gr. \$30.00; Mouse, No. 3, \$18.00 ..... 30¢

**Fly—**

Balloon, Globe or Acme ..... doz. \$1.15 to 1.25; gro. \$12.00 to 14.00  
 Harper, Champion or Paragon ..... doz. \$1.25 to 1.40; gro. \$13.50 to 15.00

**Trimmers, Spoke—**

Bonney's Nos. 1 and 2 ..... 40¢  
 Stearns ..... 25¢

**Trowels—**

Di Ston Brick and Pointing ..... 30¢  
 Di Ston Plastering ..... 25¢  
 Di Ston "Standard Brand" and Di Ston Trowels ..... 40¢  
 Never-Break Steel Garden Trowels ..... gro. \$7.00  
 Peace's Plastering ..... 30¢  
 Rose Brick and Plastering ..... 25¢ to 5¢  
 Woodrough & McFarlin, Plastering ..... 25¢ to 10¢

**Trucks, Warehouse, &c.—**

B. & L. Block Co.'s list ..... 40¢  
 Daisy Stove Trucks, Improved pattern (Genuine):  
 No. 1 2 3 10 20 30  
 Per doz \$5 25 6.00 6.75 6.30 7 25 8.00

**Tubs, Wash—**

Galvanized, per doz. \$5.00 5.50 6.00  
 Galvanized Wash tubs, S. S. & Co.:  
 No. 1 2 3 10 20 30  
 Per doz \$5 25 6.00 6.75 6.30 7 25 8.00

**Twine—**

Miscellaneous—

Flax Twine—

No. 2, 3/4 and 1/2-lb. Balls ..... 25¢ to 26¢  
 No. 1, 3/4 and 1/2-lb. Balls ..... 19¢ to 22¢  
 No. 18, 3/4 and 1/2-lb. Balls ..... 16¢ to 19¢  
 No. 24, 3/4 and 1/2-lb. Balls ..... 15¢ to 18¢  
 No. 30, 3/4 and 1/2-lb. Balls ..... 15¢ to 18¢  
 Chalk Line, Cotton, 1/2-lb. Balls ..... 18¢ to 20¢  
 Cotton Mops, 6, 9, 12 and 15 lb. to doz ..... 7¢ to 8¢  
 Cotton Wrapping, 5 Balls to lb ..... 9¢ to 10¢  
 American 5-Ply Hemp, 1/4 and 1/2-lb. Balls ..... 12¢ to 13¢  
 American 3-Ply Hemp, 1-lb. Balls ..... 12¢ to 13¢  
 India 5-Ply Hemp, 1/4 and 1/2-lb. Balls (Spring Twine) ..... 10¢ to 10¢  
 India 3-Ply Hemp, 1-lb. Balls ..... 10¢

India 5-Ply Hemp, 1/2-lb. Balls ..... 5¢ to 5¢  
 2, 3, 4 and 5-Ply Jute, 1/2-lb. Balls ..... 8¢ to 8¢  
 Mason Line, Linen, 1/2-lb. Balls ..... 45¢  
 No. 284 Mattress, 1/4 and 1/2-lb. Balls ..... 5¢ to 5¢  
 Wool ..... 7¢

**Vises—**

Solid Box ..... 40¢ to 50¢  
 Bonney's Saw Vises ..... 40¢ to 10¢

**Parallel—**

Athol Machine Co.:  
 Simpson's Adjustable ..... 40¢  
 Standard ..... 40¢  
 Amateur ..... 40¢ to 10¢  
 Bonney's ..... 40¢ to 10¢  
 Fisher & Norris Double Screw ..... 15¢ to 10¢  
 Hollands':  
 Machinists' ..... 40¢  
 Key-stones ..... 40¢  
 Lewis Tool Co. .... 20¢ to 25¢  
 Massey's Perfect ..... 15¢ to 20¢  
 Massey's Clincher ..... 30¢ to 40¢  
 Merrill's ..... 20¢  
 Miller's Falls ..... low list 10¢  
 Parker's:  
 Victor ..... 20¢ to 25¢  
 Regular ..... 20¢ to 25¢  
 Vulcan ..... 40¢ to 45¢  
 Combination Pipe ..... 55¢ to 60¢  
 Prentiss ..... 20¢ to 25¢  
 Sargent's ..... 40¢  
 Simpson's Adjustable ..... 40¢  
 Snelliker's X. L. .... 20¢ to 25¢  
 Stephens' ..... 20¢ to 25¢  
 Toole's Woodworking ..... 25¢  
 Van, W. & W. Hdw. Co. .... 40¢

**Saw Filers—**

Bonney's, No. 1, \$13; No. 3, \$16 50¢ to 10¢  
 Diaston's D 3 Clamp and Guide, 4 doz. \$30 ..... 25¢  
 Reading ..... 40¢ to 10¢  
 Wentworth's Rubber Jaw, Nos. 1, 2 and 3 ..... 30¢ to 75¢

**Miscellaneous—**

Signal & Keeler Combination Pipe Vise ..... 60¢  
 Parker's Combination Pipe:  
 87 Series ..... 60¢  
 187 Series ..... 60¢ to 5¢  
 No. 870 ..... 40¢

**Wads—Price Per M.**

B. E., 11 up ..... 60¢  
 B. E., 9 and 10 ..... 70¢  
 B. E., 8 ..... 80¢  
 B. E., 7 ..... 80¢  
 F. E., 11 up ..... \$1.00  
 F. E., 9 and 10 ..... 1.25  
 F. E., 8 ..... 1.50  
 F. E., 7 ..... 1.50  
 Ely's B. E., 11 and larger ..... \$1.70 to 1.75  
 Ely's B. E., 12 to 20 ..... \$5.00 to \$3.25

**Wagon Jacks—**

See Jacks, Wagon.

**Ware, Hollow—**

Aluminum—

S. S. & Co. Reduced List ..... 40¢

**Cast Iron, Hollow—**

Stove Hollow Ware:  
 Ground ..... 65¢ to 65¢10¢  
 Unground ..... 70¢ to 70¢10¢  
 White Enamelled Ware:  
 Maslin Kettles ..... 80¢ to 80¢10¢  
 Boilers and Saucepans ..... 50¢ to 60¢  
 Tinned Boilers and Saucepans ..... 50¢ to 60¢

**See also Pots, Glue.****Enamelled—**

Agate Nickel Steel Ware, list July '99, 35¢  
 Granite Ware, list Jan. 1, '94, revised Jan. 2, '95 ..... 40¢ to 10¢  
 Second Quality, Agate Nickel Steel, 65¢  
 Second Quality, Granite ..... 70¢ to 10¢70¢10¢10¢

**Iron Clad:**

Peppered Ware, high list ..... 70¢  
 Mottled Ware, high list ..... 75¢  
 Never Break Enamelled ..... 50¢ to 50¢10¢

**Tea Kettles—**

Galvanized Tea Kettles:  
 Inch ..... 6 7 8 9  
 Each ..... 10¢ 10¢ 10¢ 10¢

**Steel Hollow Ware.**

Avery Spiders & Griddles ..... 65¢ to 65¢5¢  
 Avery Kettles ..... 50¢  
 Porcelain ..... 50¢ to 50¢10

<b>Washers—</b>	
<b>Leather, Axle—</b>	
Solid.....	80¢ 10¢ 10¢ 85¢
Patent.....	85¢ 85¢ 85¢
Coil: 1/2 1 1 1/2 1 3/4 1 1/2	
11c 12c 13c 15c per 100	
<b>Iron or Steel</b>	
Size bolt ... 5-16 3/4 1/2 5/8 3/4	
Washers.....	\$5.60 4.70 3.00 3.20 3.00
In lots less than one keg add 1/4c per lb., 5-lb. boxes add 1/2c to list.	
<b>Cast washer—</b>	
Over 1/2 inch. barrel lots ... per lb., 2c	
<b>Washer Cutters—</b>	
See Cutters. Washer.	
<b>Washing Machines—</b>	
See Machines. Washing.	
<b>Water Coolers—</b>	
See Coolers. Water.	
<b>Weaners—</b>	
Tyler's New Haler—No. 1 1/2 doz. \$3.45;	
No. 2, \$3.70; No. 3, \$4.00; No. 4, \$4.30;	
Tyler's Saver—Nos. 1 and 2, 1/2 doz. \$1.70;	
No. 3, \$2.00; No. 4, \$2.30.	
<b>Wedges—</b>	
Oil Finish.....	lb. 3 1/2c
Box Finish.....	lb. 4c

<b>Weights, Sash</b>	
Eastern prices.....	\$25.00
Western prices.....	\$20.00
NOTE.—There is a wide difference in prices East and West, and some Foundries are naming lower prices than the above	
<b>Well Buckets, Galvanized</b>	
See Pails. Galvanized.	
<b>Wheels Well—</b>	
8-in. \$1.75 to \$1.85; 10-in. \$2.25 to \$2.35;	
12-in. \$2.75 to \$2.85; 14-in. \$3.25 to \$3.40	
<b>Wire and Wire Goods—</b>	
Brt. and Ann. 6 to 9..... 70¢ 10¢	
Brt. and Ann. 10 to 18..... 72¢ 10¢	
Brt. and Ann. 19 to 25..... 75¢ 10¢	
Brt. and Ann. 27 to 35..... 75¢ 10¢	
Cop'd and Galv. 6 to 9..... 70¢ 10¢	
Cop'd and Galv. 10 to 18..... 70¢ 10¢	
Cop'd and Galv. 19 to 25..... 72¢ 10¢	
Cop'd and Galv. 27 to 35..... 72¢ 10¢	
Tinned. 6 to 11..... 70¢ 10¢	
Tinned. 12 to 18..... 70¢ 10¢	
Tinned. 19 to 25..... 70¢ 10¢	
Tinned. 27 to 35..... 70¢ 10¢	
Annealed Wire on Spools..... 60¢ 10¢	
Brass and Copper Wire on Spools..... 50¢ 10¢	
Brass, list Feb. 26, '96..... 20¢	

Copper, list Feb. 26, '96.....	15¢
Cast Steel Wire.....	50¢
Stubs' Steel Wire.....	\$6.00 to \$2.40¢
Wire Cloth: Line, see Lines.	
Wire Picture Corl. see Corl.	
<b>Bright Wire Goods—</b>	
Iron and Brass, list July 1, 1899.....	
85¢ 10¢ to 95¢ 10¢ 5¢	
<b>Wire Cloth and Netting—</b>	
Galvanized Wire Nettings..... 10¢ 5¢ 2¢	
Painted Screen Cloth per 107 ft.....	
\$1.30 to \$1.40	
<b>Hardware Grade, Iron:</b>	
2 to 20 mesh..... sq. ft. 2 1/2¢ to 3c	
20 to 30 mesh..... sq. ft. 2 1/2¢ to 3c	
Galv. Hardware Grade, 2 to 5 mesh.....	
sq. ft. 3 1/2¢ to 4c	
Galv. Hardware Grade, 6 to 8 mesh.....	
sq. ft. 4¢ to 4 1/2c	
<b>Wire Barb—See Trade Report.</b>	
<b>Wire, Ro e—See Rope, Wire.</b>	
<b>Wrenches—</b>	
Agricultural..... 70¢ 10¢ to 70¢ 10¢ 5¢	
Baxter's S..... 60¢ 10¢	
Cox's Genuine..... 40¢ 10¢ to 55¢ 5¢	
Cox's Mechanics..... 40¢ 10¢ to 55¢ 5¢	
Acme..... 60¢ 10¢	
Allen's Pocket (Bright)..... 50¢ 10¢	
Alligator..... 60¢ 10¢ to 70¢	

<b>Benis &amp; Cull's:</b>	
Adjustable S.....	35¢ 5¢
Adjustable S Pipe.....	40¢
Brigg's Pattern.....	30¢ 10¢
Combination Black.....	40¢ 5¢
Combination Bright.....	40¢
Cylinder or Gas Pipe.....	55¢
Extra Heavy.....	55¢
Merrick's Pattern.....	50¢ 10¢
No. 3 Pipe, Bright.....	55¢
Rindley Automatic.....	30¢
Roadman's.....	33¢ 5¢
Roll Doz. W. & R.....	60¢ 10¢
Donohue's Engineer.....	40¢ 10¢
Facile.....	50¢ 10¢
Hercules.....	70¢
Solid Handles, P. S. & W.....	40¢ 10¢
Stevenson.....	50¢ 10¢ to 10¢
<b>Wrought Goods—</b>	
Staples, Hooks, &c., list March 17	
'92..... 55¢ 5¢ to 55¢ 10¢	
<b>Yokes, Neck—</b>	
Covert Saddlery Works, Trimmings..... 1.00 to 55¢	
Covert Saddlery Works, Neck Yokes.....	
Centers..... 70¢	
<b>Yokes, Ox, and Ox Bows—</b>	
Fort Madison's Farmers & Freighters'.....	
list not	
<b>Zinc—</b>	
Sheet..... lb. 6 1/2c to 7c	

## PAINTS, OILS AND COLORS.—Wholesale Prices.

<b>White Lead, Zinc, &amp;c.</b>	
Lead, Foreign white, in Oil.....	7 1/4¢ 9 1/4¢
Lead, American White, in Oil:	
Lots of 500 lb or over.....	6 1/4¢
Lots less than 500 lb.....	6 3/4¢
Lead, White, in oil, 25 lb tin	
pails, add to keg price.....	1¢
Lead, White, in oil, 12 1/2 lb tin	
pails, add to keg price.....	1¢
Lead, White, in oil, 1 to 5 lb as-	
sorted tins, add to keg price.....	1 1/4¢
Lead White, Dry in bbls.....	5 1/4¢
Lead, American, Terms: On lots of 500	
lbs. and over, 60 days, or 25¢ for cash if	
paid in 15 days from date of invoice.	
Zinc, American, dry.....	4 1/4¢ to 4 3/4¢
Zinc, Paris, Red Seal, dry.....	8 1/4¢
Zinc, Paris, Green Seal, dry.....	9 1/4¢
Zinc, Antwerp, Red Seal, dry.....	7 1/4¢
Zinc, Antwerp, Green Seal, dry.....	9 1/4¢
Zinc, V. M. French, in Poppy Oil,	
Green Seal:	
Lots of 1 ton and over.....	11 1/4¢ to 12 1/4¢
Lots of less than 1 ton.....	12 1/4¢ to 13 1/4¢
Zinc, V. M. French, in Poppy Oil,	
Red Seal:	
Lots of 1 ton and over.....	10 1/4¢ to 11 1/4¢
Lots of less than 1 ton.....	10 1/4¢ to 11 1/4¢
Discounts.—V. M. French Zinc.—Dis-	
counts to buyers of 10 bbl. lots of one or	
assorted grades, 15; 25 bbls, 25; 50	
bbls, 45.	
<b>Dry Colors.</b>	
Black, Carbon.....	2 1/2¢ to 3¢
Black, Drop, Amer.....	2 1/2¢ to 3¢
Black, Drop, Eng.....	7¢ to 11¢
Black, Ivory.....	15¢ to 21¢
Lamp, Com.....	3¢ to 5¢
Blue, Celestial.....	2 1/2¢ to 3¢
Blue, Chinese.....	35¢ to 40¢
Blue, Prussian.....	30¢ to 38¢
Blue, Ultramarine.....	3¢ to 35¢
Brown, Spanish.....	1 1/4¢ to 1 1/2¢
Brown, Vandyke, Amer.....	1 1/4¢ to 2 1/4¢
Brown, Vandyke, Foreign.....	2 1/4¢ to 3 1/4¢
Carmine, No. 40.....	2 1/2¢ to 2 3/4¢
Green, Chrome, ordinary.....	5¢ to 6¢

Green, Chrome, pure.....	18¢ to 20¢
Lead, Red, bbls, 50 bbls, and keg:	
Lots of 500 lb or over.....	6 1/4¢
Lots less than 500 lb.....	6 3/4¢
Litharge, bbls, 1/2 bbls, and keg:	
Lots of 500 lb or over.....	6 1/4¢
Lots less than 500 lb.....	6 3/4¢
Ocher, French Washed.....	1 1/4¢ to 2 1/4¢
Ocher, Dutch Washed.....	4 1/4¢ to 5 1/4¢
Ocher, American.....	\$10.00 to \$15.00
Orange Mineral, English.....	8¢ to 9¢
Orange Mineral, French.....	11¢ to 12 1/2¢
Orange Mineral, German.....	8 1/4¢ to 9 1/4¢
Orange Mineral, American.....	8 1/4¢ to 9 1/4¢
Red, Indian, English.....	4 1/4¢ to 5 1/4¢
Red, Indian, American.....	3¢ to 3 1/4¢
Red, Turkey, English.....	4¢ to 6¢
Red, Tuscan, English.....	7¢ to 10¢
Red, Venetian, Amer.....	100¢ to 110¢
Red, Venetian, English.....	1,800¢ to 2,100¢
Sienna, Italian, Burnt and	
Powdered.....	3 1/4¢ to 9 1/4¢
Sienna, Ital., Raw, Powd.....	3 1/4¢ to 7 1/4¢
Sienna, American, Raw.....	1 1/2¢ to 2 1/2¢
Sienna, American, Burnt and	
Powdered.....	1 1/4¢ to 2 1/4¢
Talc, French.....	\$100 to \$125 to \$6.00
Talc, American.....	90¢ to 1.10
Terra Alba, French.....	100¢ to 1.00
Terra Alba, English.....	95¢ to 1.00
Terra Alba, American No. 1.....	45¢ to 70¢
Terra Alba, American No. 2.....	45¢ to 50¢
Umber, Turkey, Bnt. & Powd.....	2 1/4¢ to 3 1/4¢
Umber, Turkey, Raw & Powd.....	2 1/4¢ to 3 1/4¢
Umber, Bnt. Amer.....	1 1/4¢ to 2 1/4¢
Umber, Raw, Amer.....	1 1/4¢ to 2 1/4¢
Yellow, Chrome.....	10¢ to 25¢
Vermilion, American Lead.....	10¢ to 25¢
Vermilion, Quicksilver, bulk.....	72¢
Vermilion, Quicksilver, bags.....	73¢
Vermilion, English, Import.....	81¢
Vermilion, Chinese.....	88¢ to 95¢
<b>Colors in Oil.</b>	
Black, Lampblack.....	10¢ to 14¢
Blue, Chinese.....	36¢ to 40¢
Blue, Prussian.....	32¢ to 33¢
Blue, Ultramarine.....	12¢ to 16¢

Brown, Vandyke.....	9 1/4¢ to 13¢
Green, Chrome.....	8¢ to 12¢
Green, Paris.....	6¢ to 13¢
Sienna, Burnt.....	10¢ to 13¢
Umber, Raw.....	9 1/4¢ to 12¢
Umber, Burnt.....	9 1/4¢ to 12¢
<b>Miscellaneous.</b>	
Barytes, Foreign, 1/2 ton.....	\$19.00 to \$21.00
Barytes, Amer. float.....	19.00 to 20.00
Barytes, Crude.....	8.00 to 10.00
Chalk, in bulk.....	2.63¢ to 2.75¢
Chalk, in bbls.....	100¢ to 35¢
China Clay, English.....	12.00 to 17.50
Cobalt, Oxide.....	100¢ to 2.50¢
Whiting, common.....	100¢ to .52¢
Whiting, Gilders.....	.54¢ to .64¢
Whiting, extra Gilders.....	.55¢ to .68¢
<b>Putty.</b>	
In bulk.....	\$1.00
In bladders.....	2.40
In cans, 12 lb to 25 lb.....	2.50
In cans, 1 lb to 5 lb.....	3.60
<b>Spirits Turpentine.</b>	
In Southern bbls.....	43¢ to 45¢
In machine bbls.....	43¢ to 45¢
<b>Glue.</b>	
Low Grade.....	12¢ to 15 1/2¢
Cabinet.....	13 1/2¢ to 16 1/2¢
Medium White.....	14 1/2¢ to 18 1/2¢
Extra White.....	16¢ to 23¢
French.....	12¢ to 40¢
Irish.....	13 1/4¢ to 16¢
<b>Animal, Fish and Veget-</b>	
<b>table Oils.</b>	
Linseed, City, raw.....	7¢ gal. 67¢ to 68¢

Linseed, City, boiled.....	69¢ to 70¢
Linseed, S. and W. in raw.....	65¢
Linseed, raw Calcutta seed.....	67¢
Lard, Prime.....	51¢ to 55¢
Lard, Extra No. 1.....	48¢ to 50¢
Lard, No. 1.....	41¢ to 43¢
Cotton-seed, Crude.....	34¢ to 35¢
Cotton-seed, Summer Yellow,	
prime.....	32 1/2¢ to 33 1/2¢
Cotton-seed, Summer Yellow,	
off grades.....	32 1/2¢ to 33 1/2¢
Sperm, Crude.....	40¢
Sperm, Natural Spring.....	40¢
Sperm, Bleached Spring.....	40¢
Sperm, Natural Winter.....	37¢
Sperm, Bleached Winter.....	37¢
Whale, Crude.....	38¢
Whale, Natural Winter.....	38¢
Whale, Bleached Winter.....	37¢ to 40¢
Menhaden, Crude, So ind.....	25¢
Menhaden, Light Strained.....	29¢ to 30¢
Menhaden, Bleached Winter.....	35¢
Menhaden, Extra Bleached.....	40¢ to 43¢
Tallow, prime.....	40¢ to 45¢
Cocanut, Ceylon.....	5 1/4¢ to 5 1/2¢
Cocanut, Cochiti.....	6 1/4¢ to 6 1/2¢
Coal, Domestic.....	30¢ to 33¢
Coal, Newfoundland.....	34¢ to 36¢
Red Elaine.....	34¢ to 36¢
Red Saponified.....	5 1/2¢ to 6¢
Olive, Italian, bbls.....	55¢ to 60¢
Neatsfoot, prime.....	48¢ to 50¢
Palm, prime, Lagos.....	5 1/4¢ to 6¢
<b>Mineral Oils.</b>	
Black, 20 gravity, 25 gals cold	
test.....	9 1/4¢ to 10 1/4¢
Black, 20 gravity, 15 cold test.....	10 1/4¢ to 11 1/4¢
Black, sunon.....	9 1/4¢ to 9 1/2¢
Cylinder, light filtered.....	13 1/4¢ to 17 1/4¢
Cylinder, dark filtered.....	11 1/4¢ to 16 1/4¢
Paraffine, 903-907 gravity.....	14 1/4¢ to 15 1/4¢
Paraffine, 903 gravity.....	13 1/4¢ to 14 1/4¢
Paraffine, 884 gravity.....	12 1/4¢ to 13 1/4¢
Paraffine, red, No. 1.....	14 1/4¢ to 15 1/4¢
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1. *Journal of the American Medical Association*, 1997; 277: 1033-1037.

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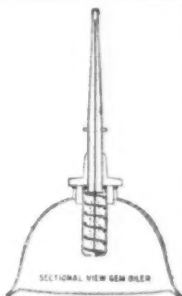
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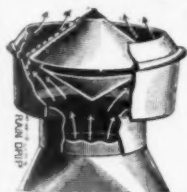
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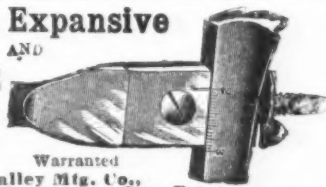
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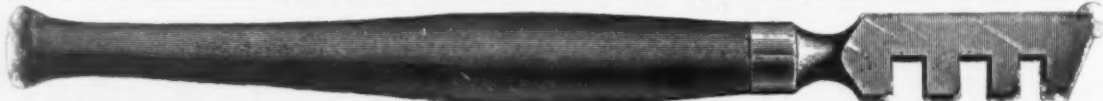
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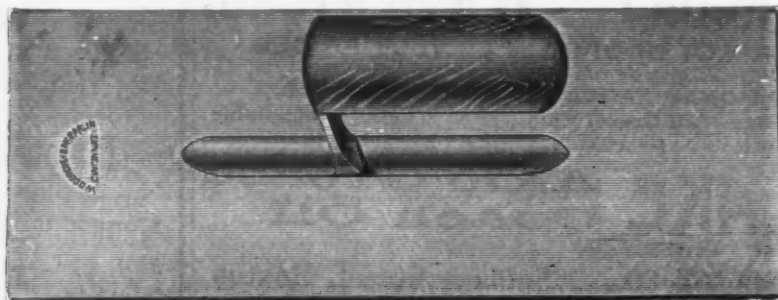
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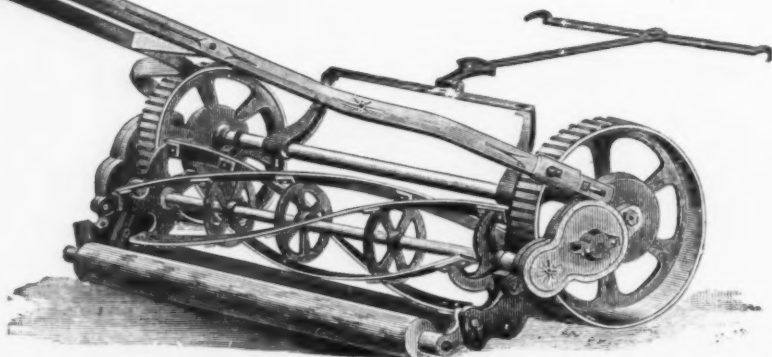
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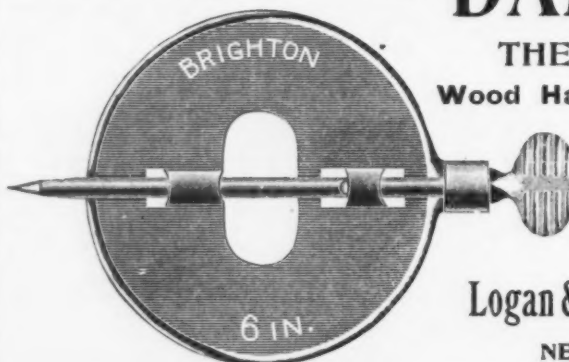
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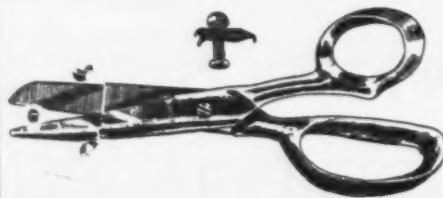
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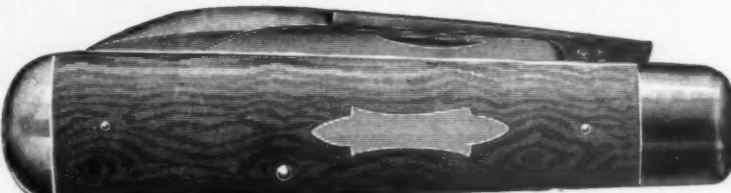
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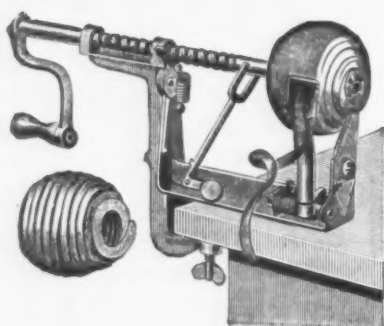
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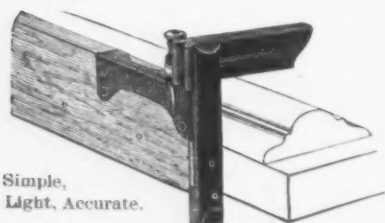
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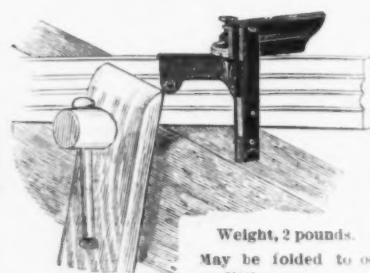


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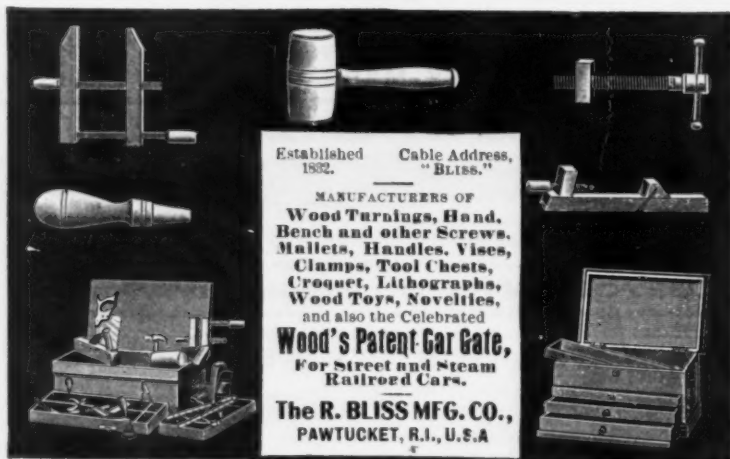
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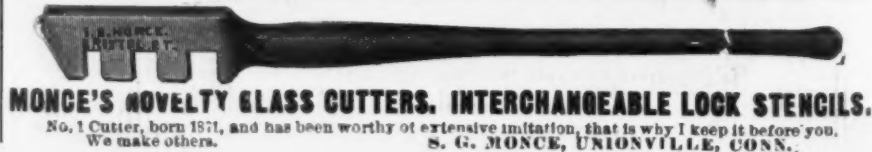
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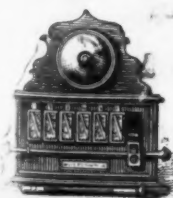
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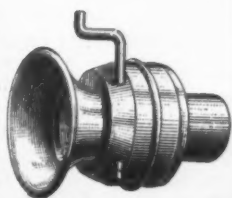


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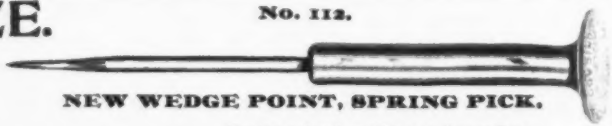
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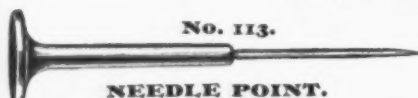
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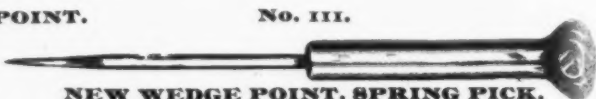
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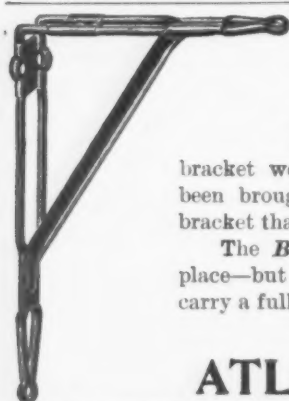


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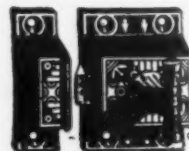
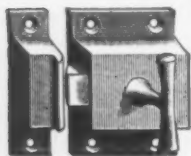
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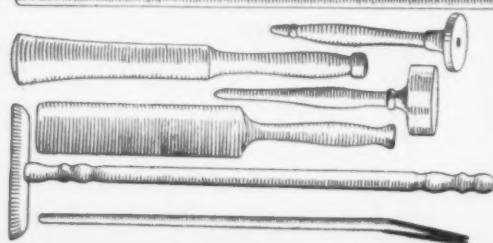
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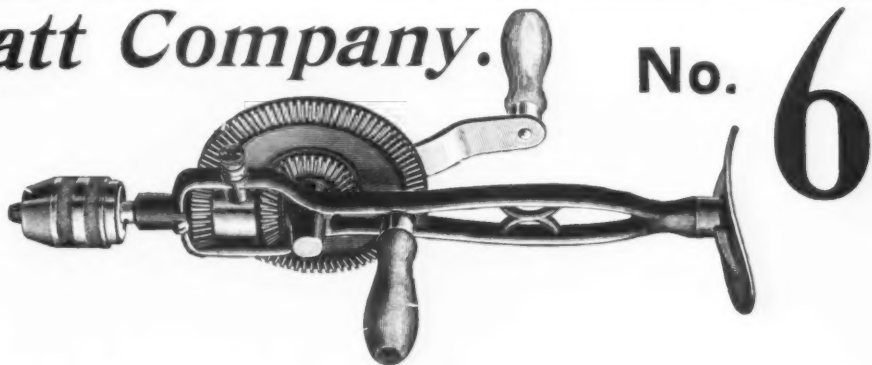


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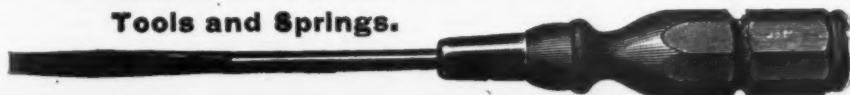
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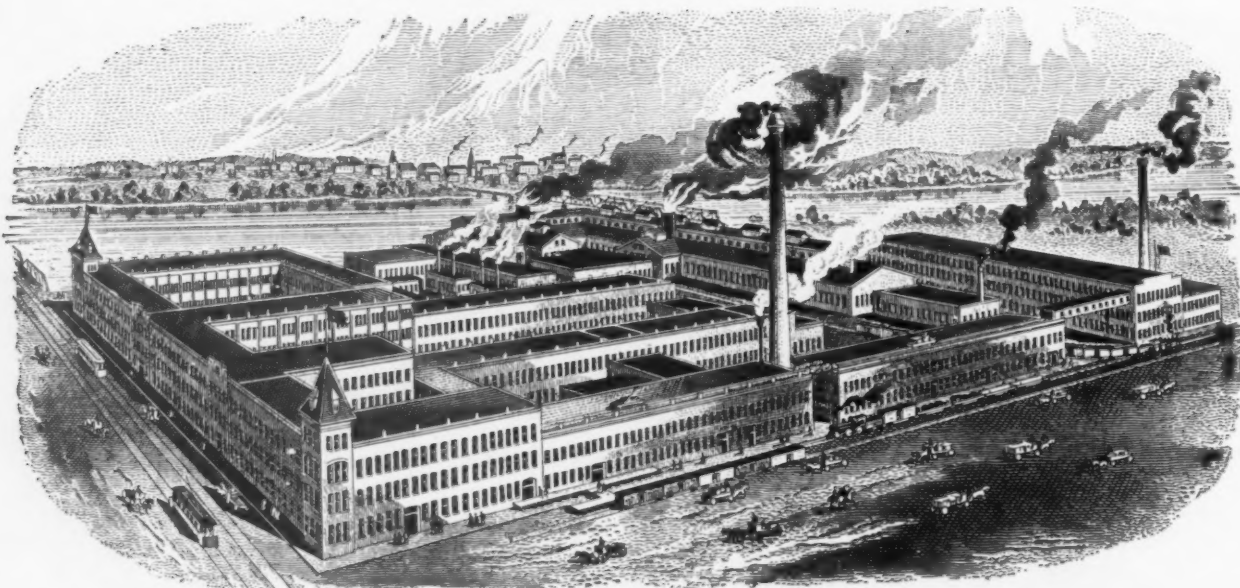
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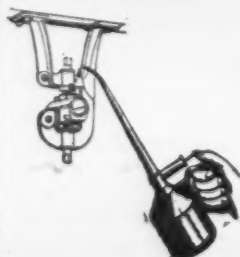
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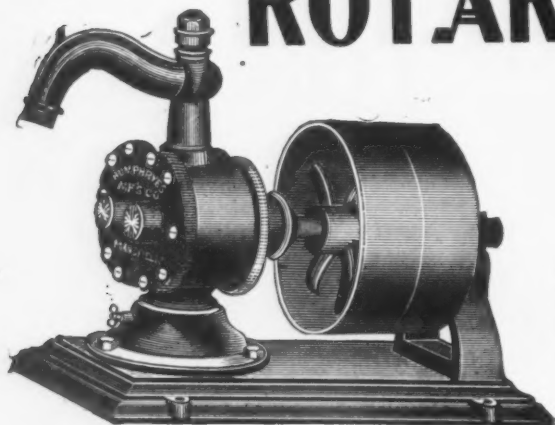
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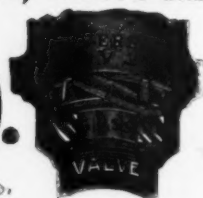


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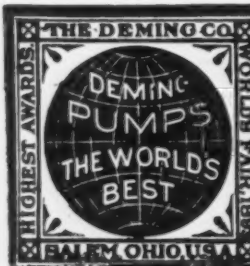
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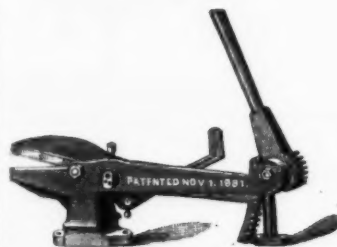
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Brades' Trowels,**"Eureka" Patent Shear.**The most effective implement  
for cutting wire rods and strip  
metal.Should be kept in stock by  
every hardware dealer.**SIMPLE. DURABLE. STRONG. CHEAP.**

Made in two sizes:

- No. 1 cuts round metal up to  $\frac{1}{4}$  inch.  
cuts sheet metal up to  $\frac{3}{8}$  inch.
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cuts sheet metal up to 3-16 inch.

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BRIDGEPORT, CONN.**THE IDEAL CEMENT WORKERS' TOOLS.**

Imprint Rollers, Driveway Groovers, Bevel Tools, Concrete Cutters and Jointers, Tampers, Radius Tools, Quarter Rounds, Combined Curb and Gutter Tools, Curb and Gutter Form, Trowels, Name-Plates and Stamp. Our Tools are made of Bell Metal and Bronze. Will not corrode. Satisfaction guaranteed. Send for Catalog and Discounts.

Ideal Tool Co., 838 E. Washington St., Indianapolis, Ind.



Is unquestionably the best machine of its kind ever offered to the public. It will cut without crushing raw or cooked meat, sea food, fruit, vegetables, etc., into coarse or fine pieces, according to the cutter used, of which three accompany each chopper.

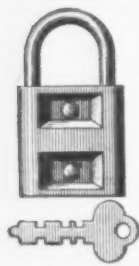
It has eliminated all the objectionable features of other choppers and has added several improvements that are distinctly its own. It is always in order and the knives require no sharpening.

An additional and exclusive feature of the Star Food Chopper is a plate hinged at the top of the hopper which, when pressed on the food to be cut, forces it upon the feed screw, thus preventing the possibility of injuring or soiling the fingers, which is liable to occur in using other choppers.

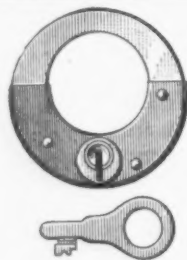
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CHAS. D. BROWN, Sole Agent,  
160 Duane Street, New York City.**EGG BEATERS.** We make the largest line in the world. Send for samples and prices. **STANDARD CO.,** 107 Haverhill St., Boston, U. S. A.





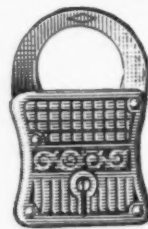
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Pressed Steel.



Pressed Steel.



Pressed Steel.



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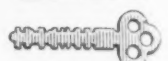
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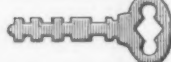
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## STAR AND BOSTON HEEL PLATES,



Made in 5 sizes

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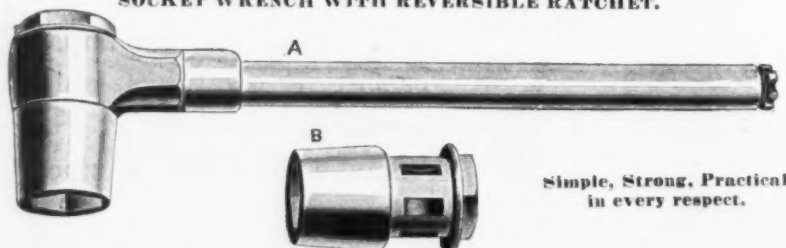
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Only first-class material used in the manufacture of these tools. Perfect Mechanical Construction, High-grade Finish.

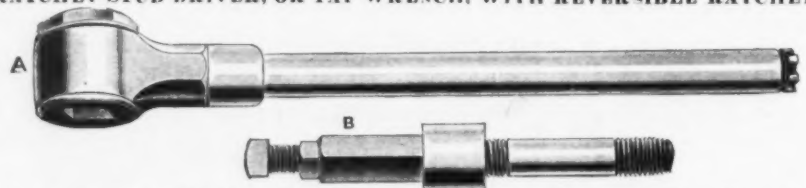
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Simple, Strong, Practical  
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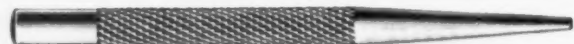
The body of this Wrench is made of Drop-forged Steel. The Nut Socket, cut "B," is Steel; the handle is of Bar Steel, insuring the greatest possible strength. The Ratchet is entirely enclosed, preventing dirt or other obstacles interfering with its working. Can be made reversible instantly by slightly withdrawing the knob at end of handle and making a half turn.

### RATCHET STUD DRIVER, OR TAP WRENCH, WITH REVERSIBLE RATCHET.



This tool consists of holder, socket and stud nut. Indispensable in a Machine Shop. Useful for Boiler Makers, Plumbers, and Steam Fitters' Work. For general utility and economy is without equal.

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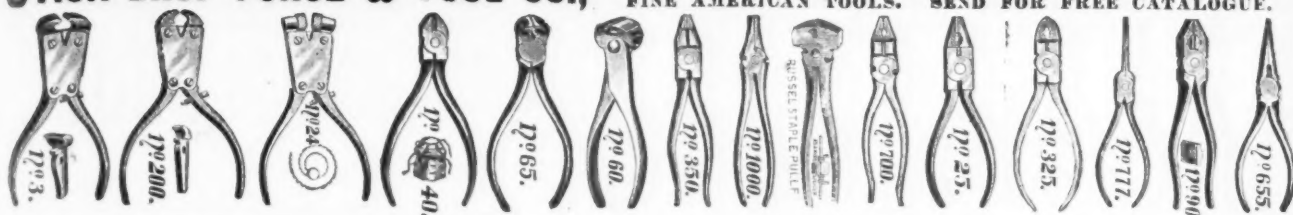
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The Handiest and Most Perfect Clamp.

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## PATENTED ARTICLES OF MALLEABLE IRON.

NEW pattern Heavy Screw Clamps.  
Strongest in the market.



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The Genuine Improved  
KNIFE HANDLE  
PATENTED.

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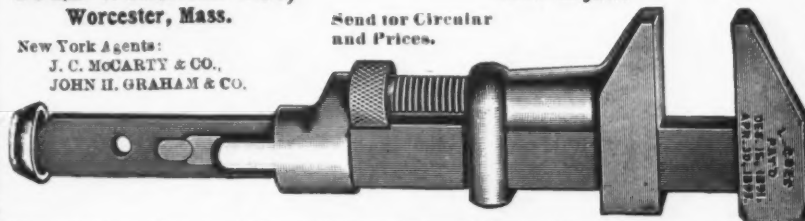
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**COES WRENCH CO.,**  
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Has a straight bar and extra long nut for  
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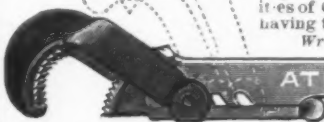


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A HIGH CLASS DROP FORGED STEEL TOOL.

QUICK, EFFECTIVE and POSITIVE in adjustment. The good qual-  
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THE L. S.  
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COMPANY  
ATHOL, MASS., U.S.A.

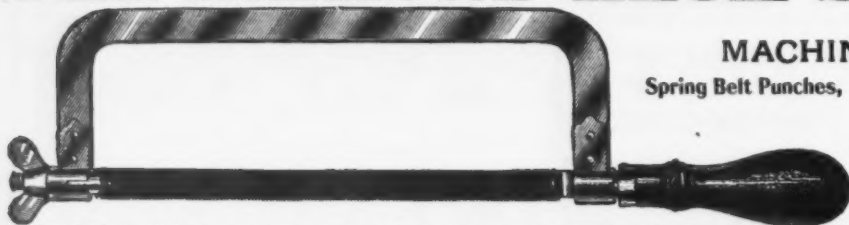
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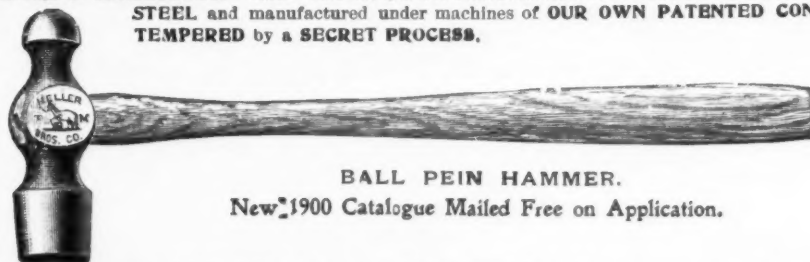
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Die and Steel Forgings.

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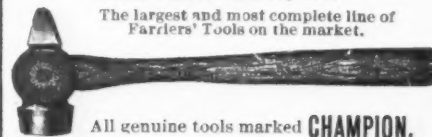
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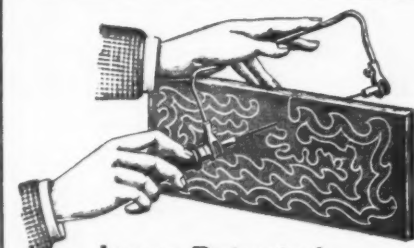
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All genuine tools marked **CHAMPION**.



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This saw is constructed with a tubular back, through which runs a string or a cable, connecting both ends of saw frame, which causes the blade to turn to any angle by turning the handle only without removing it from the work. Send for circular.

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Severance  
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PRICE \$2.00

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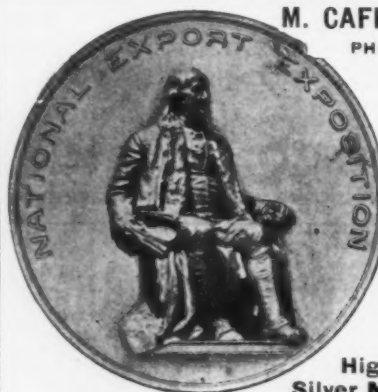
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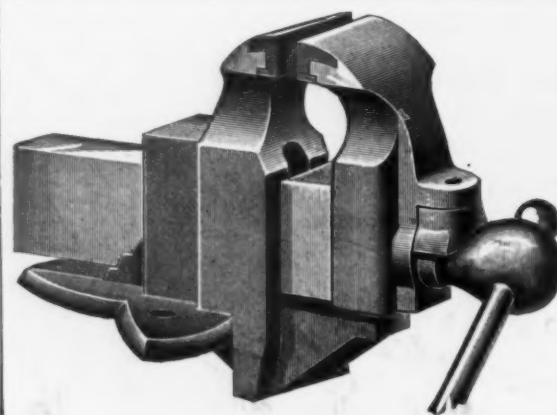
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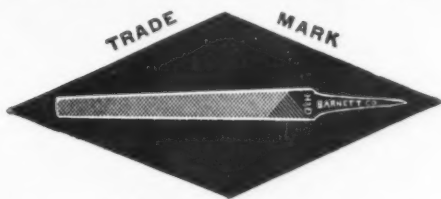
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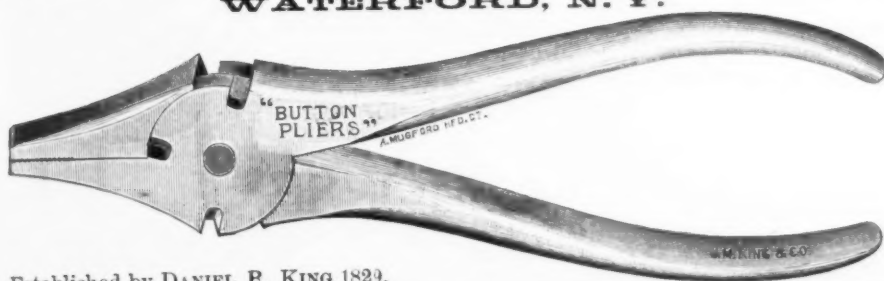
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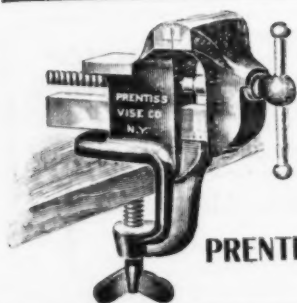


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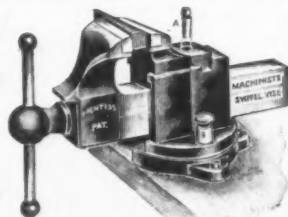
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Established by DANIEL P. KING, 1829.



We make all  
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of Vises.

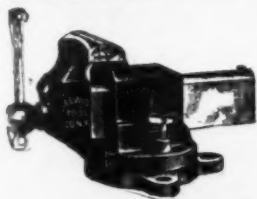
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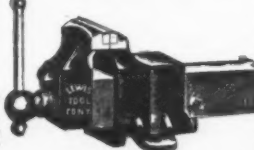
Sole Agents for Great Britain: CHAS. NEAT & CO.,  
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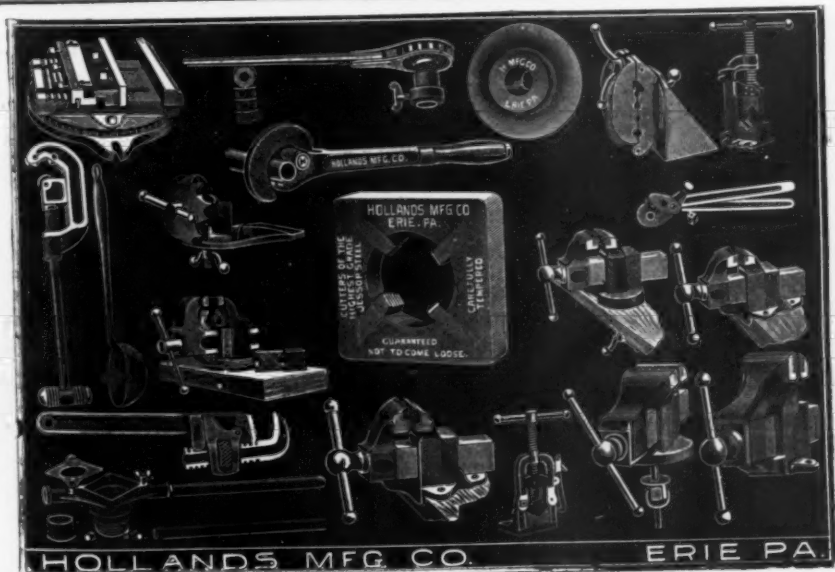
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Commence to draw as soon as  
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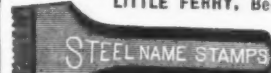
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has interchangeable jaws. Improved method of holding and releasing chain. No locking. Send for catalog.

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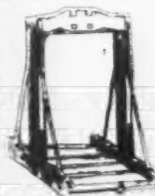
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THE Taintor Positive Saw Set 33 has every good point possessed by any other saw set, besides a number peculiar to itself.

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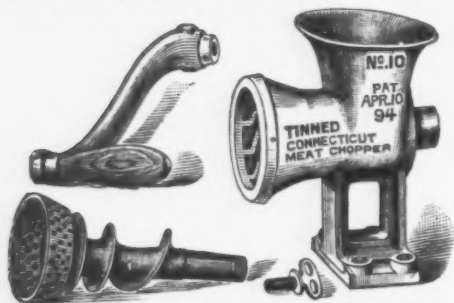
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STENCILS-BURNING BRANDS  
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CRACKERS, ETC.

ONLY TWO PARTS TO CLEAN.

Manufactured by  
O. D. WOODRUFF,  
Pottstown, Pa.



NO. 2 COMPOUND LEVER.

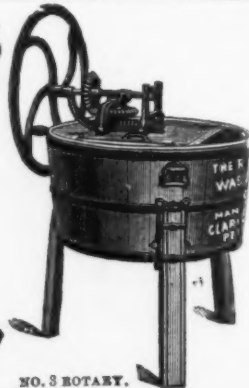
## The Peoria Washers

are the strongest, best made machines for the purpose on the market to-day. They have Cedar Tubs with Galvanized Hoops. Inside castings, Tinned Malleable Iron. Leg brackets, malleable iron and bolted to tub with Tinned Bolts. Will wash as well as by hand, with less than  $\frac{1}{4}$  the labor.

Manufactured by

CLARK, QUIEN & MORSE,

402 S. WASH. ST., PEORIA, ILL.



NO. 3 ROTARY.

## Loss of Time

on the part of employees is often less due to dishonesty on their part than to lax methods on the part of employer.

## One way--the surest way--

to prevent this loss is to instal Simplex Time Recorders throughout the shops.

\*\*\*

THE LANG & GOODHUE MFG. CO., Engineers and Machinists, Burlington, Vt., say of this device: "It has inculcated punctuality in our entire force."

HIBBARD, SPENCER, BARTLETT & CO., Chicago, Ill., write us: "This system is saving us money."

THE PORT CHESTER BOLT & NUT CO., Port Chester, N. Y., say: "It is the best thing of its kind we have ever seen."

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Is everything "good enough" in your system of keeping time? If not, let us hear from you.

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## SIMPLEX TIME RECORDER CO.,

GARONER, MASS., U. S. A.


(Successors to Time Recorder Dept. of Heywood Bros. & Wakefield Co.)  
272 Wabash Ave., Chicago, Ill.  
N. E. Agents, Moore & Booth, 170 Summer St. (Opp. So. Station), Boston, Mass.

BIGELOW  
WIRE FLY KILLER.

A Quick Seller.  
Good Profits.

Trade sample on application  
"Mamma says she wouldn't keep house without the FLY KILLER."

J. P. BIGELOW, Mgr.  
Worcester, Mass.



**The Ideal Food Cutter.**  
CUTS EVERYTHING EDIBLE.  
CUTS FINE OR COARSE JUST AS NEEDED.

Cutting Parts are of Tempered Steel.  
All Parts can be Duplicated.

THE MOST SATISFACTORY FAMILY MEAT AND FOOD CUTTER EVER MADE.

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## Cronk's Combination Fencing Plier and Staple Puller.



Made of forged Steel. Indispensable to builders and for repairing wire fence. Send for our new catalogue showing complete line of *Pliers, Barn Door Hangers, Track, Stays, Rakes, Pruning Shears and other Hardware Specialties.*

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KILLS without crushing, and no danger of soiling finest fabrics.  
KING FLY KILLER is almost invisible, so flies are quickly killed.  
—Manufactured by—  
R. R. MONTGOMERY & CO., Decatur, Illinois.



Sample free to dealers.

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**TINNED**

*Made in 35 Sizes and Styles for Hand and Power*

*From \$1.00 to \$275.00*

They have always given satisfaction and will continue  
so to do

Trade Mark "ENTERPRISE" on a machine is  
a Guarantee of its Quality

Insist on your Jobber supplying

"ENTERPRISE" CHOPPERS

Descriptive Catalogue FREE

*The Enterprise Mfg. Co. of Pa.*

*Philadelphia, Pa., U. S. A.*

N. Y. Branch, 10 Warren St.

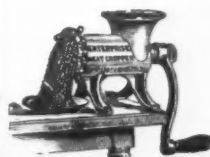
San Francisco Branch, 105 Front St.



No. 2, - - \$1 50  
Chops 1 lb. per minute



No. 5, - - \$2 00  
Chops 1½ lbs. per minute



No. 12, - - \$2 50  
Chops 3 lbs. per minute



## S & B GALVANIZED and CORRUGATED WASH TUBS.

(PATENT APPLIED FOR).

**Strongest, Best and Most Handsome  
Wash Tub Made.**

NO BUCKLING OR BENDING.

CORRUGATED ON BOTH SIDES AND BOTTOM.

SIDES MAY BE USED AS A WASH BOARD.

We make all descriptions of Placed, Heavy Polished, Stamped, Japanned  
and Gray Flint Enameled Ware.

MANUFACTURED SOLELY BY

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FOUR SIZES.			
Number	0	1	2
Diameter at top, inches,	20½	21¼	23½
Diameter at bottom, inches,	16½	18	19½
Capacity, quarts,	4½	52	62

WRITE FOR PRICES.

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**The Sterling Chopper**

AND

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TWO UNEQUALED KITCHEN TOOLS.

*Have you seen the slicer? It's just out.*

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STEP  
LADDERS

have the highest recommendation from thousands of customers. They are the handsomest and easiest-running ladders made; work noiselessly, and are absolutely safe and durable. Ladders are made to order and to fit all kinds of shelving, in various styles, to suit all purposes.

Write for  
Descriptive  
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Address

**G. A. Milbradt & Co.,**  
1922 and 1924 N. Broadway, St. Louis, Mo.  
Or **JOHN CALANDER,**  
148 E. 8th St., St. Paul, Minn.



## Of Course

he is pleased. He is admiring the improvements made in the hardware store in his town.

OF COURSE

**J. D. WARREN  
MFG. CO.,**  
CHICAGO, ILLS.,  
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Do you want your customers to be pleased? If so, write us to-day for information, prices, etc.

THE BICYCLE STEP LADDER.  
Especially adapted for Hardware Stores.

The newest, neatest, simplest, easiest operated and safest store ladder made. Highest Award World's Fair. Write us **THE BICYCLE STEP LADDER CO.,** 63 Randolph St., Chicago, Ill. Eastern Agent, H. N. YOUNG, 9 Clinton Place, New York City. New York City and vicinity, E. J. RUSSEY & CO., 80 John St., New York City. California, JOHN WOODLOCK, 154-156 First St., San Francisco, Cal. North Western States, HOWE SCALE CO., Portland, Ore. Texas and S. W., E. D. FOY, Dallas, Tex.

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Look the matter up. Descriptive circular with list of references and prices mailed on request. We also make a general line of Paper Boxes.  
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**PERFECT SHELF BOXES**  
WE MAKE  
**PERFECT SHELF BOXES**

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RAVENSWOOD, W. VA.

Made of Wood.  
No screws or  
nails used to work  
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your shelving.

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IF YOU WANT TO KNOW  
ALL ABOUT THE BEST

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LADDER

SEND FOR OUR CATALOG TO-DAY  
**MORLEY BROTHERS,**  
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STEEL  
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BOXES

ANY SIZE TO  
FIT YOUR SHELVING.  
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**HELLER BOX CO.**  
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## Cast Brass Butt Hinges

IN STOCK AND FOR SALE BY

**W. & J. TIEBOUT,**

No. 118 Chambers St., New York,

MANUFACTURERS OF

**BRASS, GALVANIZED & SHIP CHANDLERY  
HARDWARE.**

## IF YOU WANT TO KNOW ASK US

How to file catalogues, quotations and every class of data, with no more trouble to file than to throw in the waste basket, and as easy to get when wanted as though in your vest pocket.

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**THE JESSE JONES PAPER BOX CO.,**  
618 and 617 Commerce St., Philadelphia.

Made of Wood.  
No screws or  
nails used to work  
out and cut  
your shelving.

WHITE  
MOUNTAIN  
FREEZER

Quickest  
Freezing

Best  
Results

Economical  
Durable

The Standard of Excellence Everywhere  
SOLD BY ALL LEADING JOBBERS.

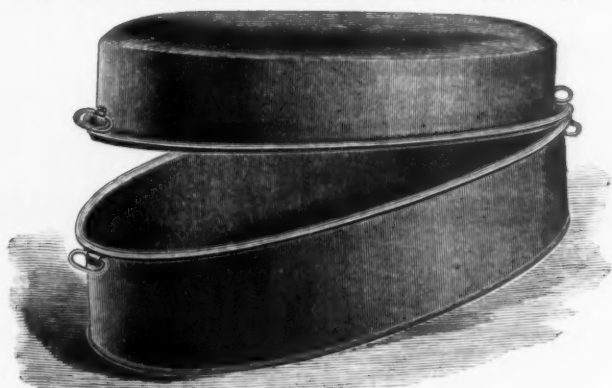
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DROP  
FORGINGS

**THE M. SEWARD & SON CO.,**  
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Estimates promptly furnished.

Seamless **'SAVORY ROASTERS'**—Patented**THE BEST TO USE—BECAUSE—**

Bottom is raised off the oven, so meat will cook evenly on all sides and cannot burn. Needs no water, no grease, no attention.

**THE ONLY SELF-BASTING ROASTER—BECAUSE—**

Bottom is OVAL and juice from meat flows to the lowest point where it is vaporized and deposited again on the surface of the meat.

**THE EASIEST TO CLEAN—BECAUSE—**

It is perfectly smooth and seamless inside, with NO CORNERS OR SEAMS TO COLLECT BURNED GREASE. An excellent seller to those who want a GOOD ROASTER.

Write to Our House Nearest You.

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**STARTING** a profitable, permanent trade is easy for the hardware dealer who carries our line.

The prestige which our trade mark gives will enable him to win more business than he could with any other line.

Our product includes Door Springs, Door Pulls, Kicks or Push Plates, House Numbers, Barn Door Hangers, etc.

Our prices are equitable and we make a specialty of prompt shipments.

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Why is the



Patented 1898.

Because it is the only **ROTARY WASHER** that has **Revolving Steel Ball Gearing**, therefore light running and noiseless. No escape of steam; made of red cypress lumber; solid leg staves (not removable, breakable legs); wheel turns either way; dasher reverses automatically, cleaning clothes without rubbing them to pieces. Made to last.

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**Metal Skylights**

**OF ALL DESCRIPTION,  
ESPECIALLY FOR FACTORIES**

Send for Catalogue and Prices.

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Ventilators and Sheet Metal Work.

**FORGINGS**  
Carriage, Bicycle and Special.



Correspondence Solicited.

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*A Pamphlet, 109 Pages,  
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This book describes accurately in narrative form one of the methods of promoting and carrying on a combination or pool. It is recognized as an important contribution to the discussion of the measures manufacturers resort to for protection from the effects of excessive competition.

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This book deals with the prevailing evils of unreasonable competition in the retail hardware trade.

It presents in interesting narrative form the policy and procedure of The Ironville Hardware Association, a local combination of merchants.

In the history of the methods of this organization are set forth many excellent suggestions and much "Food for Thought" for Hardwaremen.

It tells how this association was successfully established, how and why in the face of many difficulties the members were enabled to maintain fraternal relations.

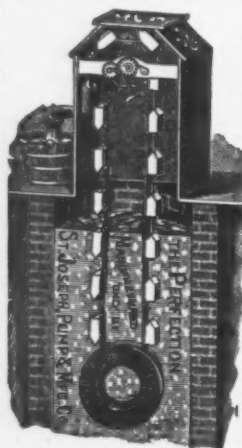
How a uniform and profitable standard of prices was instituted, and finally, how the local trade was re-established on a sound business basis to the permanent benefit of all concerned.

It is a common sense business book and will be useful and suggestive to hardware dealers as illustrating prevailing conditions in the trade.

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the bulk of water for drinking purposes is consumed during the summer months. Sell your trade a

### WATER PURIFIER,

something that sets water a-sparkling with fresh air every time the wheel goes round. First-class Hard ware, Pump and Implement Jobbers all know a good thing and handle the

## "Perfection" Bucket Pump

Write for sample outfit to-day.  
Catalog free.

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## The Virginia Rotary Washing Machine.



Patented Nov. 21, 1899.

Easy Running. Simple. Made of  
Selected Virginia White Cedar.  
Welded Wire Hoops.

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### CHAMPION EGG OPENER.



PATENTED JAN. 4, 1887.  
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### REFRIGERATORS.



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About one-half the Refrigerators  
sold are "WHITE MOUNTAINS."  
Practically all the trouble comes  
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**Maine Manufacturing Co.,**  
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**A. C. WILLIAMS,**  
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MANUFACTURER OF

## Cast Hammers and Hatchets

in almost endless variety. Special styles suitable  
for the trade of different countries

THE LARGEST VARIETY OF SAD IRONS IN THE  
WORLD.

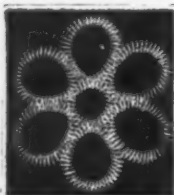
Specialties in Hardware  
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We made and sold 2,000,000 Sad Irons in 1899.

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Exclusive Export Sales Agents.

## THESE THREE ARTICLES ARE THE BEST OF THEIR KIND.



Tea or Coffee Pot Stand, one  
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**TOWEL RACK.**  
HAS NO EQUAL.

Manufacturers of Woven Wire  
Hammocks, Steel Hat Racks,  
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Toaster and Broiler,  
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SWINGING  
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REMOVABLE  
CYLINDER

ESPECIALLY  
CONVENIENT  
FOR  
LARD  
PRESSING.

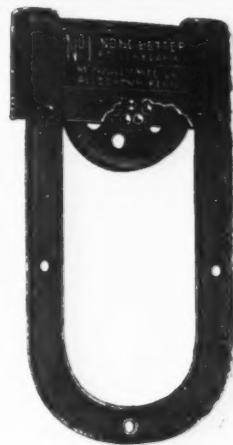
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NATIONAL SPECIALTY MFG. CO., Lehigh Ave. and Third St., Philadelphia, Pa.

Steel  
Goods.

Door Hangers,  
Door Track and Stay Rollers,  
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Felloe Plates and Washers,  
Warehouse Trucks and Specialties.

**McKINNEY MFG. CO.,**  
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**D**O YOU know what a Poised Carrier is? If not, buy and sell the Coburn Rolling Door Hangers and you will get them, and you do not get them with any other make. They will when used in conjunction with the Coburn Round Trough Trolley Track be found to be the "*Ne Plus Ultra*" in door hangers.

**The Coburn Trolley Track Mfg. Co.,**

Holyoke, Mass., U. S. A.



We want your order now...if it is only a small trial order to begin with...and we know it will prove to you that our products are the best and most satisfactory sellers. Send to us for free samples of wares and catalogue.

### TO DEALERS.....

While we know that our wares are the best on the market for design, finish and durability, and that our price is always consistent, we nevertheless are spending thousands of dollars acquainting the buying public with their trade-names, thereby assisting you in making sales. You must recognize this fact, and to protect yourself you must carry a complete line of our make of goods.

We deserve your patronage and good will because our wares are the best for the money and the because we are doing most good for you. We are making the following wares household names and you cannot afford to be without them...this is not sentiment but sound business:

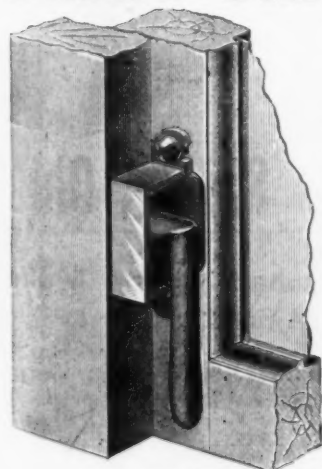
**AMETHYST, DRESDEN,  
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TRIPLE COATED ENAMELED WARES.

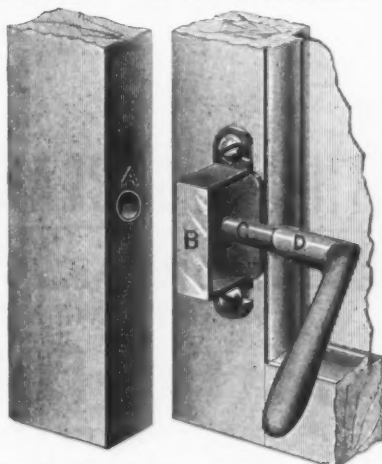
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## Dolber's Storm Window Fasteners.



**Strong,  
Simple,  
Durable.**

Send  
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Best device known for putting up Stationary Outside Windows, Screens, Shutters, and all similar purposes.

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## THE NEW WAYNE ROTARY WASHER.

No complicated gearing to get out of order or broken. Simply one large pinion fastened on the shell or cover; one small pinion attached to the post; another small pinion meshing in the large one attached to shaft, and the Rack Bar; that's all. Washer operates right or left, the large hand wheel is attached to side of tub, does not have to be lifted with the cover; when latter is down it is always ready for business.



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153,662 lbs. of Iron and Steel have been made into **Lyon Egg Beaters and Cream Whips.** Send for New Price-List Circular.

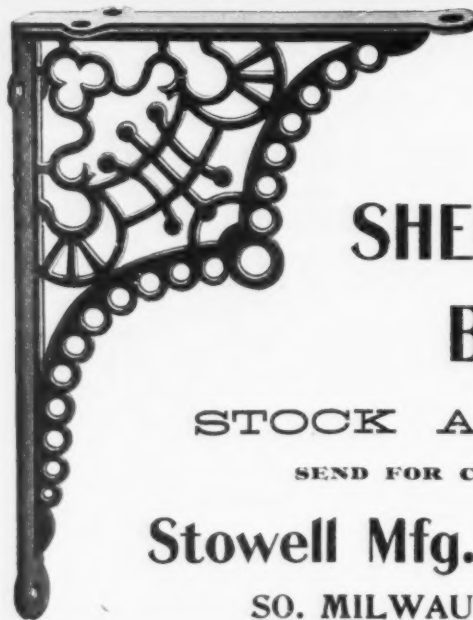
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## CATALOGUES.

- No. 1, GENERAL.
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**SPECIAL**  
**.. SALE**  
**OF**  
**SHELF ..**  
**BRACKETS**

STOCK AT COST.

SEND FOR CIRCULARS.

**Stowell Mfg. & Fdy. Co.,**  
SO. MILWAUKEE, WIS.

*"God helps those who help themselves."*

We are doing our level best to help ourselves  
—by giving our customers (first of all) the **BEST**  
**DOOR HANGERS** on earth.

**WILCOX MFG. CO.,**      =      -      **AURORA, ILL.**

REGIS-  
TERS  
and  
VENTI-  
LATORS.  
NOT IN  
COMBINA-  
TION.

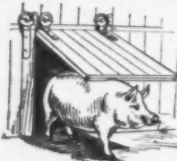
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Prices.

Folding Lunch Box

Japanned and Ornamented.  
Made in Two Sizes.  
Send for Trade Discount.

SEARVEY MFG. CO., Boston, Mass.

## THE MYERS "Stayon" Flexible Door Hanger,

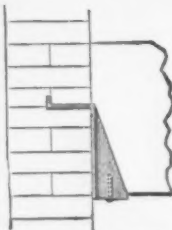


With steel roller bearings, easy to push and to pull, cannot be thrown off the track—hence its name—"Stayon."  
Mechanically perfect yet simple in construction. 3/4 inch wheels. Track of double strength of others and reversible. Each door can be raised or shoved outward independent of the other, or held rigid as desired—an **special feature** in the "Stayon" hanger.  
Write for descriptive circular and prices. Exclusive agency given to right parties who will buy in quantity.

F. E. MYERS &amp; BRO.,

Ashland, Ohio.

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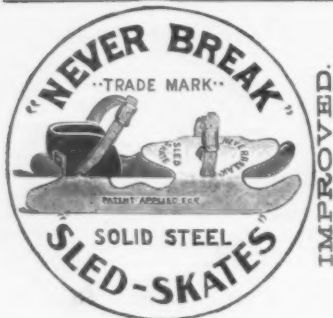


Don't weaken the Joists  
or Headers or Walls by  
cutting into them. Use  
hangers. We make all  
sizes.

Send for Hanger List.



**THE W. J. CLARK CO.,** Salem, Ohio.



**"NEVER-BREAK."** Best Finished Goods Made.  
SOMETHING NEW. WE HAVE IT.

TRADE  
MARKS  
ALLOWED.

**SKATES FOR CHILDREN.**

PATENTS  
APPLIED  
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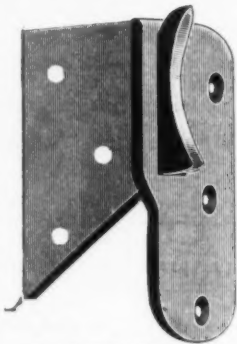
WRITE TO US FOR PRICES, ETC.

**THE AVERY STAMPING CO.,** Cleveland, Ohio, U. S. A.

J. C. McCARTY &amp; CO, 10 Warren St., New York Representatives.

# Schroeder's Patent Hangers and Fasteners

**For Storm Sash and Screens.**



Invisible Hanger.



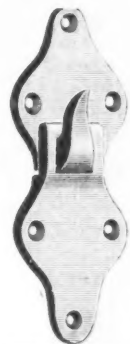
Schroeder's Patent Fastener. 10 inches Long.

Made from Wrought Steel. Light and Strong.

With these hangers storm sash can be very easily and quickly put up or taken down *without the aid of ladder, nails, screws or tools of any kind.*

The fastener permits the sash to be swung out for ventilation or cleaning.

The most perfect device made for hanging storm sash and screens.



Visible Hanger.

FOR SALE BY LEADING JOBBERS. SEND FOR CIRCULARS.

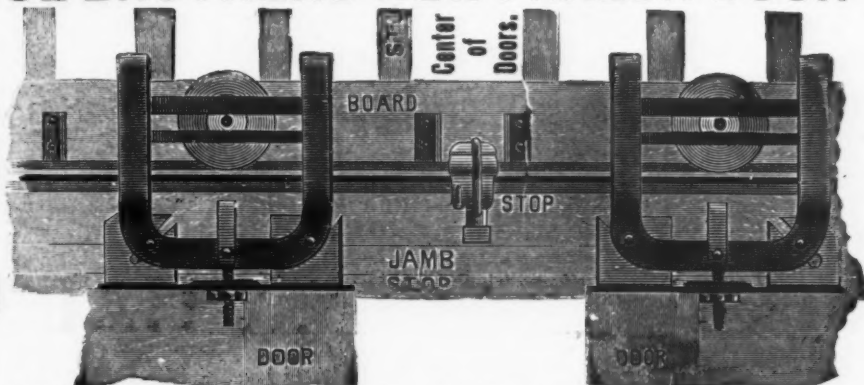
**THE STANLEY WORKS,**

New Britain, Conn.

79 Chambers St., N. Y.

## LAWRENCE BROTHERS NEW PARLOR DOOR HANGER.

**Steel  
Frame,  
Vulcanized Hard  
Fiber Wheel,  
Double Flanged  
Steel Rail.**

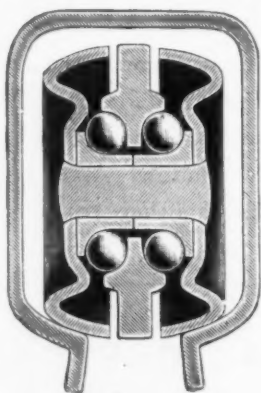


**Perfectly  
Noiseless,  
Hanger Frame will  
work on either  
side of Base  
Plate.  
No Rights or Lefts.  
No Metal Flanges  
to Rattle.**

Apply for Circulars  
and Prices.

**LAWRENCE BROTHERS, STERLING, ILLINOIS,**

Manufacturers of Steel Strap Hinges, Door Hangers,  
Pulleys, and other Hardware Specialties.



To secure the best device on the market for hanging sliding doors, order the McCabe Ball-Bearing Door Hanger. Write for catalogue and prices. The McCabe Hanger Mfg. Co., 540 W. 22d Street, New York.

## The Walda Sectional Window Weight.



Square and Round Weights Hang exactly from centre. Only 10 inch pockets required. Eliminates use of lead weight.

**The  
Hardware  
Dealer**

with one-sixth the stock required in one piece weights can fill any order. Weight crates with 100 lbs in a box, both plainly marked.

## The Contractor

saves time, money and delay by balancing windows exactly at once.

SEND FOR CIRCULAR.

**Barney & Reed M'fg Co.,**

85 Water Street, - BOSTON, MASS.

## SASH WEIGHTS.

**E. E. BROWN & CO.,**

McKean and Meadow Sts.,

PHILADELPHIA, - - PA.

**United States Steel Lock Co.,  
CLINTON, IOWA,**

SOLE MAKERS

## WARNER LOCKS.

**LOCKS.**

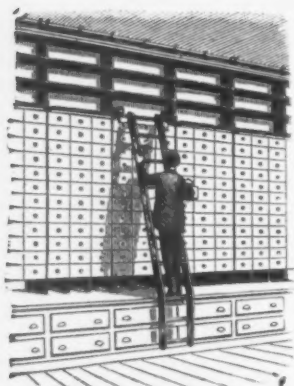
Cold Rolled Steel.  
Accurate in Construction.  
Unsurpassed in Quality.

**HARDWARE.**

Artistic in Design.  
Elegant in Finish.  
Moderate in Price.



## The Lane Store Ladder.



Supported by a Steel Ball Bearing Carriage having fibre tread wheels. The Track does not obstruct shelving (is exactly in front of one of the shelves), and has movable brackets that are secured to uprights wherever they may be. No rail on counter or floor. Ladders made to order at factory, complete with fixtures attached. Customer needs only erect rail and hang ladder on it. No good store can afford to get along without a rolling ladder. Lane's is best. Send for catalogue.

**LANE BROTHERS CO.,**

Prospect and River Sts.,

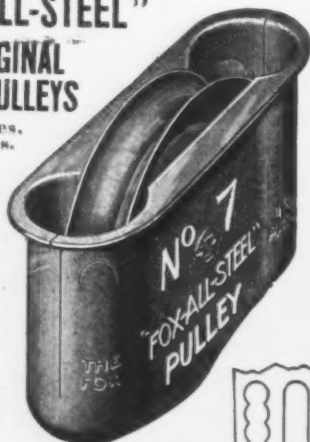
POUGHKEEPSIE, N. Y.

### "FOX-ALL-STEEL"

THE ORIGINAL  
STEEL PULLEYS

Two Styles,  
Two Sizes.

LIGHT  
STRONG  
NOISE-  
LESS  
DURABLE



2 1/2 in. Wheel for EITHER a FOUR HOLE  
or STRAIGHT SIDE MACHINE MORTISE.  
ADAPTED TO ANY ONE'S USE.

Write for our **SAMPLE PULLEYS FREE.**  
Catalogue and  
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### Palmer's Common Sense Frame Pulley.



MANUFACTURED BY  
**PALMER HARDWARE MFG. CO.,**  
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**SILVER LAKE  
SASH CORD**  
Has been the standard for thirty years.

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BY THE  
**SILVER & S. LAKE CO.**  
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Every Hank Bears the Above Label.  
SEND FOR SAMPLE.



For Butler's Pantry Doors and  
all other Swing doors the . .

### "Bardsley" Checking Spring Hinge

is unequalled. It closes the  
door with a soft, gentle and  
noiseless action and stops it at  
once at the centre. It goes in  
the floor under the door.

Made in 6 Sizes. Catalogue Free.  
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47 to 191 Baxter Street, New York.

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Manfrs. of  
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Frame Pulleys, Casters, Shelf Brackets, Sash  
Lifts, Drawer Pulls, Hooks, Thumb  
Latches and other goods.

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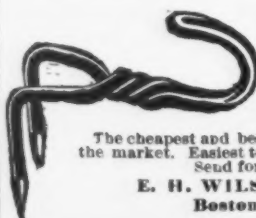
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MAKERS  
OF THE

"Pullman"  
Hardware  
Specialties

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"HANDY"  
Clothes Line  
**HOOK.**

The cheapest and best galvanized hook on  
the market. Easiest to put up  
Send for price.

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Family  
Grindstones  
For Home Use.  
Mounted  
Grindstones  
For Farm Use.

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For all Kinds of Grinding.  
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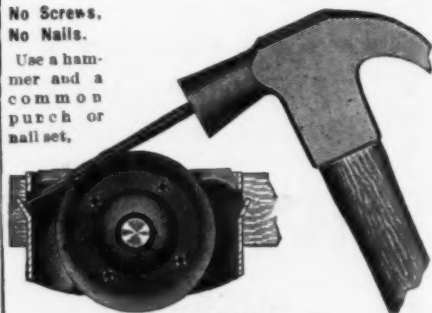
As the best substitute for sash cords  
ever made. Some in daily use over  
25 years. These chains are easily  
applied to any window. Will run  
equally as well on either round or  
square groove pulleys.

MANUFACTURED BY

**THOMAS MORTON,**  
65 Elizabeth Street,  
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No Screws,  
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Use a ham-  
mer and a  
common  
punch or  
nail set.



Method of fastening the  
**GRAND RAPIDS ALL STEEL SASH PULLEYS.**  
Save Freight, Save Time, Save Money. Samples Free.  
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21 Pearl St., Grand Rapids, Mich.

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10 AND 12 GAUGE

One Tool for Two Gauges

\$1.50 Each

WILL Re and De Cap any of the New High Grade Paper Shells of any make.

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WE manufacture lockers as a regular business, and can make an outfit for your shop, either from our standard designs or your specification, at less cost than you can for yourself.

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We work all kinds of Sheet Metal in all kinds of shapes.

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By All Leading Dealers.

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PARTLETT & CO., Chicago. F. B. CHAMBERLAIN CO., St. Louis. C. G.  
GRUBB, Agt., Pittsburg. A. L. PETERS, Agt., St. Paul.

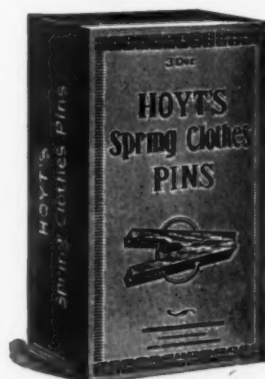
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The "PRINCE" is  
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Penetrates 1/4 in. pine.

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"KING" repeater, the "PRINCE"  
single shot, the "PRINCE" re-  
peater, and the "CHICAGO"  
breech loader, air rifles, abso-  
lutely the greatest article of  
amusement known. Shoots B B  
dropshot. For sale by all jobbers.  
Send for catalogue.

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Jobbers.Packed  
5 gross  
in a case.THE  
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Sole Mfrs.,  
MINNEAPOLIS.  
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Premier  
Automatic.Send for  
Catalogue.HARRINGTON & RICHARDSON ARMS CO.,  
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32 Calibers.NATIONAL STEEL JOIST HANGER,  
FOR WOOD HEADER AND BRICK WALLS.The best, cheapest, and latest improved  
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Iron Work.Sole Makers,  
CLEVELAND, OHIO.

Patented May, '96.

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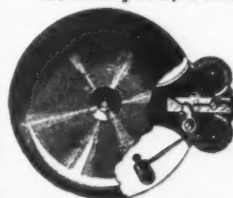
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GONG  
DOOR BELLS

Globe and Silver Chime Bells, Table Call  
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## Bells

of all descriptions;  
also BICYCLE  
SPECIALTIES.

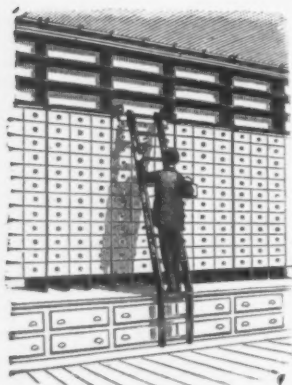
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Supported by a Steel Ball Bearing Carriage having fibre tread wheels. The Track does not obstruct shelving (is exactly in front of one of the shelves), and has movable brackets that are secured to uprights wherever they may be. No rail on counter or floor. Ladders made to order at factory, complete with fixtures attached. Customer needs only erect rail and hang ladder on it. No good store can afford to get along without a rolling ladder. Lane's is best. Send for catalogue.

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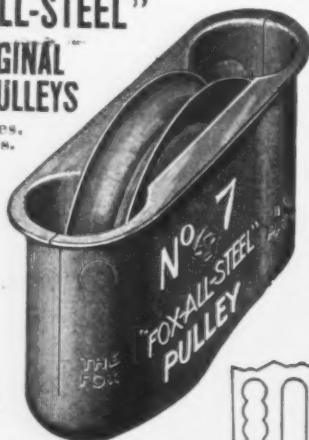
POUGHKEEPSIE, N. Y.

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THE ORIGINAL  
STEEL PULLEYS

Two Styles,  
Two Sizes.

LIGHT  
STRONG  
NOISE-  
LESS  
DURABLE



3/4 in. Wheel for EITHER a FOUR HOLE  
OF STRAIGHT -IDE MACHINE MORTISE.  
ADAPTED TO ANY ONE'S USE.

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**FOX MACHINE CO.,** 195 No. Front St.,  
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### Palmer's Common Sense Frame Pulley.



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**SILVER LAKE  
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Has been the standard for thirty years.

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For Butler's Pantry Doors and  
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Manfrs. of  
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Lifts, Drawer Pulls, Hooks, Thumb  
Latches and other goods.

SEND FOR CATALOGUE.

**WRIGHTSVILLE, PA.**

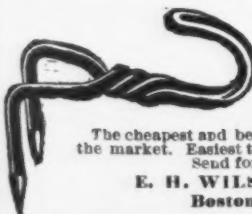
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Send for price.

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Grindstones  
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As the best substitute for sash cords  
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MANUFACTURED BY

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No Screws,  
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Use a ham-  
mer and a  
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Method of fastening the  
**GRAND RAPIDS ALL STEEL SASH PULLEYS.**  
Save Freight, Save Time, Save Money. Samples Free.  
**GRAND RAPIDS HARDWARE CO.,**  
21 Pearl St., Grand Rapids, Mich.

## Common Sense Re and De Capper

## SHOP LOCKERS.



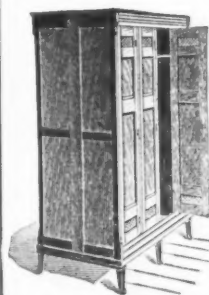
10 AND 12 GAUGE  
One Tool for Two Gauges  
**\$1.50 Each**

WILL Re and DeCap any of the New High Grade Paper Shells of any make.

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313 and 315 BROADWAY, NEW YORK.



WE manufacture lockers as a regular business, and can make an outfit for your shop, either from our standard designs or your specification, at less cost than you can for yourself.

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Providence, R. I., U. S. A.

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We work all kinds of Sheet Metal in all kinds of shapes.

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3 Cypress St.,  
Worcester, Mass

## Peters Cartridges and King's Smokeless Powder.

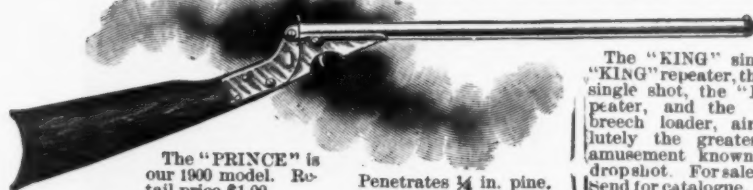
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## The Markham Air Rifles

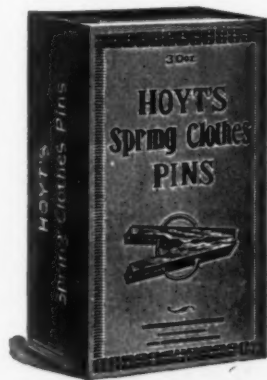


The "PRINCE" is our 1900 model. Retail price \$1.00.

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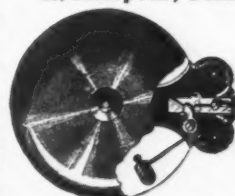
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of all descriptions; also BICYCLE SPECIALTIES.

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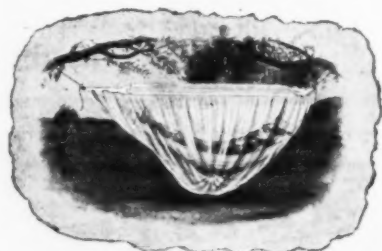


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ARAWANA with Support, Awning, and Canopy

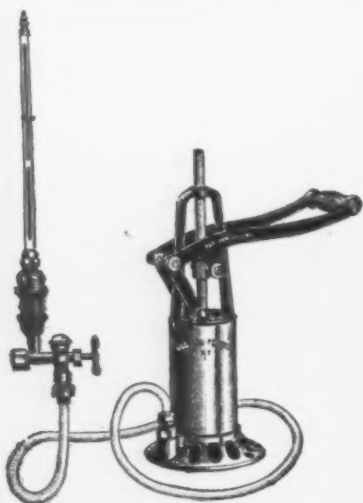
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STRONGER THAN THE SEAMLESS.

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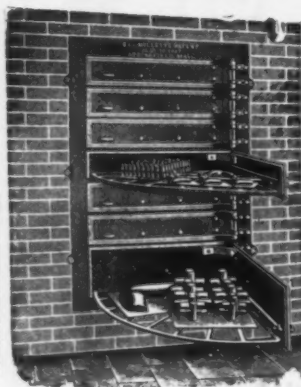
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(S. U. S. PAT. 1,111,111)  
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PATENT

No one who makes small cores  
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One closing the oven when the other is open.

**Saves Fuel, Saves Time.**

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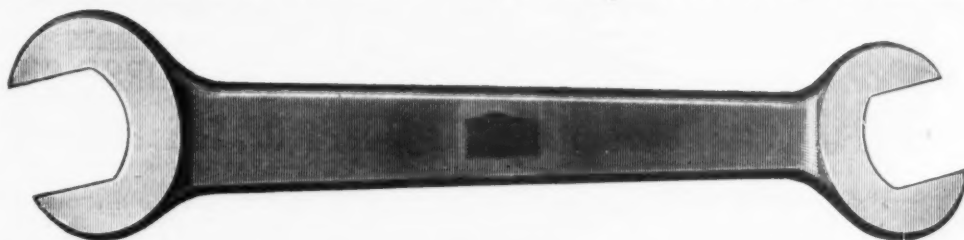
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Pattern Mak-  
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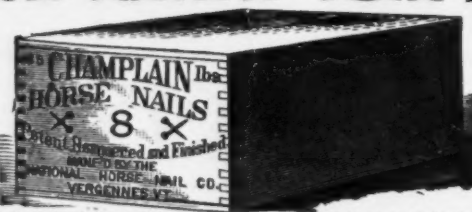
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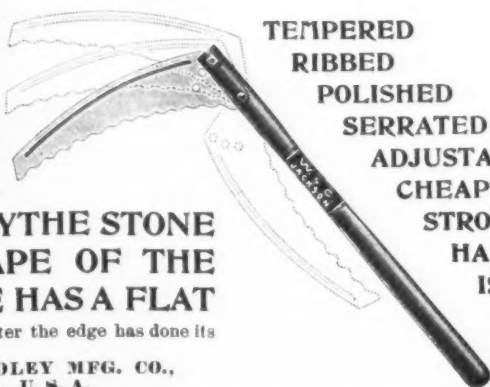
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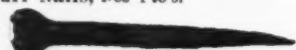
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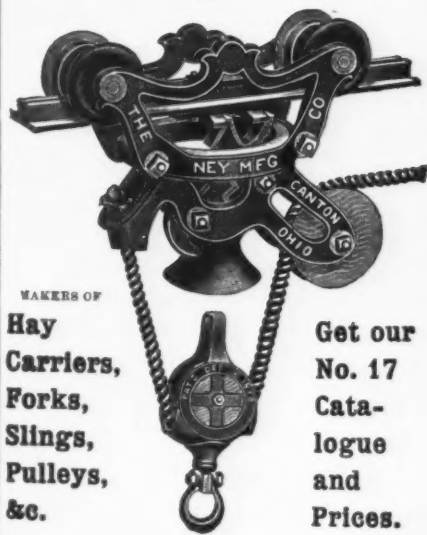
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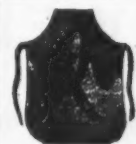
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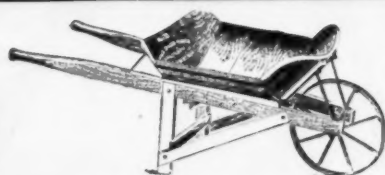
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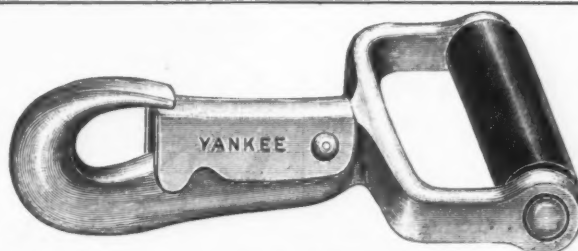
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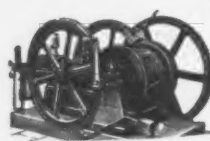
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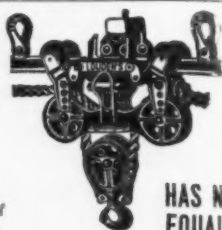
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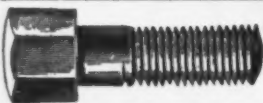
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Moore, C. P., Ravenswood, W. Va.

**Brackets, Shelf**

Atlas Mfg. Co., New Haven, Conn.

Griffin Mfg. Co., Allegheny, Pa.

Stowell Mfg. & Fdry. Co., Chicago, Ill.

**Brass and Copper**

Ansonia Brass & Copper Co., 99 John St., N. Y.

Bridgeport Brass Co., Bridgeport, Ct.

Davol, John & Sons, 100 John, N. Y.

Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

Plume & Atwood Mfg. Co., 29 Murray St., N. Y.

Randolph-Cloves Co., Waterbury, Conn.

Rutter, A. T., 256 Broadway, N. Y.

Seville Mfg. Co., Waterbury, Conn.

Shimer, H. M. & Co., Phila., Pa.

Waterbury Brass Co., 60



- New England Steel Castings Co., Philadelphia, Pa.  
 Otis Steel Co., Ltd., Cleveland, Ohio  
 Sawam, E. M., Providence, R. I.  
 Union Steel Casting Co., Pittsburgh, Pa.
- Catalogue Files**  
 Folding Paper Box Co., So. Bend, Ind.
- Ceilings, Metal**  
 Youngs own Iron & Steel Roofing Co., Youngstown, O.
- Cements, Iron**  
 Smooth On Mfg. Co., Jersey City N. J.
- Cement Workers' Tools**  
 Ideal Tool Co., Indianapolis, Ind.
- Chains**  
 Bradlee & Co., Philadelphia.  
 Bridgeport Chain Co., Bridgeport, Ct.  
 Cleveland Chain Co., Rankin, Pa.  
 Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.  
 Jenkins Iron & Tool Co., Howard, Pa.  
 Link-Belt Engineering Co., Phila., Pa.  
 McKay Jas. & Co., Pittsburgh, Pa.  
 Oneida Community, Ltd., Niagara Falls  
 Standard Chain Co., Pittsburgh, Pa.
- Chain Pliers**  
 Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.
- Chemicals**  
 Hamer & Amend, New York.
- Cherry Stoppers**  
 Enterprise Mfg. Co., Philadelphia, Pa.  
 Goodell Co., Antrim, N. H.
- Chisels**  
 Buck Bros., Millbury, Mass.  
 Buck, Chas., Millbury, Mass.  
 Jennings, C. F. & Co., 101 Reade St., N. Y.  
 White, L. & J. Co., Buffalo, N. Y.
- Christmas Tree Holders**  
 North Bros. Mfg. Co., Philadelphia, Pa.
- Chucks**  
 Cushman Chuck Co., Hartford, Conn.  
 Doebler Mfg. Co., Middletown, Conn.  
 Goodell Fruit Co., Greenfield, Mass.  
 Hoggson & Pettis Mfg. Co., New Haven.  
 Holland Mfg. Co., Erie, Pa.  
 Horton, E. & Son Co., Windsor Locks, Ct.  
 Ideal Machine Works, Hartford, Conn.  
 Pratt Chuck Co., Frankfort, N. Y.  
 Skinner Chuck Co., New Britain, Conn.  
 Standard Tool Co., Cleveland, O.  
 Union Mfg. Co., 103 Chambers, N. Y.  
 Whiton, D. E. Mach. Co., New London.
- Cider Mills**  
 Whit Hurst, R. W. & Co., Norfolk, Va.
- Circular Sawing Machines**  
 Kidder, B. E., Worcester, Mass.
- Clamps**  
 Beeley, C. H. & Co., Chicago, Ill.  
 H. H. Thos., Brooklyn, N. Y.  
 Hammer & Co., Branford, Conn.
- Clipping Machines**  
 Amer. Shearer Mfg. Co., Nashua, N. H.  
 Goodell Flexible Shaft Co., Chicago, Ill.  
 McCoy, John F. Co., 33 Warren St., N. Y.  
 Wiebusch & Hilger, Ltd., 9-13 Murray St., N. Y.
- Clothes Dryers**  
 Hill Dryer Co., Worcester, Mass.
- Clothes Line Hook**  
 Wilson, E. H. & Co., Allston, Mass.
- Clothes Pins**  
 Clark, J. R. & Co., Minneapolis, Minn.  
 U. S. Clothes Pin Co., Montpelier, Vt.
- Coal**  
 Alabama Consolidated Coal & Iron Co., Birmingham, Ala.  
 Sloes Sheffield Steel & Iron Co., Birmingham, Ala.  
 Washington Coal & Coke Co., Dawson, Pa.  
 Wister, Francis, Philadelphia, Pa.
- Coal Cars**  
 Lansing Wheelbarrow Co., Lansing, Mich.
- Coal Picks**  
 Jenkins Iron & Tool Co., Howard, Pa.
- Coal Shutes**  
 Lansing Wheelbarrow Co., Lansing, Mich.
- Coffee and Spice Mills**  
 Arcade Mfg. Co., Freeport, Ill.  
 Parker, Chas. Co., Meriden, Conn.
- Coke**  
 Alabama Consolidated Coal & Iron Co., Birmingham, Ala.  
 Bessemer Coke Co., Pittsburgh, Pa.  
 Cherry Valley Iron Co., Pittsburgh, Pa.  
 Dimmick, J. K. & Co., Phila., Pa.  
 Frick, H. C. & Co., Pittsburgh, Pa.  
 Houston, C. B. & Co., Philadelphia, Pa.  
 Sloes Sheffield Steel & Iron Co., Birmingham, Ala.  
 Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.  
 Virginia Iron, Coal & Coke Co., Bristol, Va.-Tenn.  
 Washington Coal & Coke Co., Dawson, Pa.  
 Wister, Francis, Philadelphia, Pa.
- Compressed Air Machinery**  
 Phila. Pneumatic Tool Co., Phila. Pa.
- Conductor Pipe**  
 Berger Bros. Co., Philadelphia, Pa.
- Conveying Machinery**  
 Aultman Co., Canton, Ohio.  
 Brown Hoisting & Conveying Machine Co., Cleveland, Ohio.  
 California Wire Works, San Francisco.  
 Du Bois Iron Works, Du Bois, Pa.  
 Hunt, C. W. Co., W. New Brighton, N. Y.  
 Jeffrey Mfg. Co., Columbus, O.  
 Link-Belt Engineering Co., Phila., Pa.
- Cooking Utensils**  
 Cleveland Stamping & Tool Co., Cleveland, O.
- Coping Saw**  
 Jones & Dummerman, Chicago, Ill.
- Copper**  
 Hendricks Bros., 49 Cliff, N. Y.  
 Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.  
 United Metals Selling Co., 11 Broadway, N. Y.
- Copper Hammers**  
 Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
- Copper Rivets and Bars**  
 Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
- Copper Tracks and Nails**  
 Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
- Cordage**  
 Macomb & White Rose Co., Chicago  
 Samson Cordage Works, Boston, Mass.  
 Silver Lake Co., Boston, Mass.
- Core Ovens**  
 Millet Core Oven Co., Brightwood, Mass.
- Cork Screws and Cork Pullers**  
 Erie Specialty Co., Erie, Pa.
- Corn Hooks**  
 Withington & Cooley Mfg. Co., Jackson, Mich.
- Corn Huskers**  
 Wilcox Mfg. Co., Aurora, Ill.
- Corrugated Iron and Steel**  
 Garro Iron & Steel Roofing Co., Cleveland, O.  
 McCullough Iron Co., Wilmington, Del.  
 Scaife, Wm. B. & Sons, Pittsburgh.
- Cotter Pin Machines, Automatic**  
 Shuster, F. B. Co., New Haven, Conn.
- Cotton Ties**  
 American Steel Hoop Co., Battery Park Building, N. Y.
- Counting Machines**  
 Durant W. N. Milwaukee Wis.
- Couplings, Compression**  
 Bennett, Geo. B. Co., Youngstown, O.
- Cow Ties**  
 Garland Chain Co., Rankin, Pa.  
 Oneida Community, Ltd., Niagara Falls.
- Cranes**  
 Brown Hoisting & Conveying Mch. Co., Cleveland, O.  
 Chisholm & Moore Mfg. Co., Cleveland.  
 Cleveland Crane & Car Co., Cleveland, O.  
 Niles Tool Works Co., 156-158 Liberty St., N. Y.  
 Northern Engineering Works, Detroit, Mich.  
 Pawling & Harnischfeger, Milwaukee, Wis.  
 Pneumatic Crane Co., Pittsburgh, Pa.  
 Reading Crane & Hoist Wks., Reading, Pa.  
 Ridgway, Craig & Son Co., Coatesville, Pa.  
 Speidel, J. G., Reading, Pa.
- Crayon**  
 Steward, D. M. Mfg. Co., Chattanooga, Tenn.
- Crucibles**  
 Dixon, Jos. Crucible Co., Jersey City, N. J.
- Cupolas**  
 Paxson, J. W. Co., Philadelphia, Pa.
- Curry Combs**  
 New York Stamping Co., Brooklyn, N. Y.
- Cutlery**  
 Cattaraugus Cutlery Co., Little Valley, N. Y.  
 Chatillon, John & Sons, 85 to 89 Cliff St., N. Y.  
 Dame, Stoddard & Co., Boston.  
 Goodell Co., Antrim, N. H.  
 Kimball, C. J. Co., Bennington, N. H.  
 Smith & Hemenway Co., 236 Broadway, N. Y.  
 Wiebusch & Hilger, Ltd., 9 to 13 Murray St., N. Y.
- Cutting Off Machines**  
 Hurlbut Rogers Mach. Co., So. Sudbury, Mass.
- Cylinders, Air and Gas**  
 Harrisburg Pipe Bending Co., Harrisburg, Pa.
- Dampers**  
 Logan & Strobbridge Iron Co., New Brighton, Pa.  
 Williams, A. C., Ravenna, O.
- Diamond Tools**  
 Dickinson, Thos. L., 45 Vesey St., N. Y.
- Dies**  
 Adriance Mach. Works, Brooklyn, N. Y.  
 American Hdw. Mfg. Co., Ottawa, Ill.  
 Bliss, E. W. Co., Brooklyn, N. Y.  
 Ferracuti Mach. Co., Bridgeton, N. J.  
 Hay-Budden Mfg. Co., Brooklyn, N. Y.  
 Mosberg, Frank Co., Attleboro, Mass.  
 Richard Mfg. Co., Bloomsburg, Pa.  
 Wilson & Smith, Worcester, Mass.
- Door Bells.—See Bells and Gongs.**
- Door Checks and Springs**  
 Ransley, Jos., 147 151 Baxter St., N. Y.  
 Pullman Sash Balance Co., Rochester, N. Y.
- Door Holders**  
 Caldwell Mfg. Co., Rochester, N. Y.
- Draught Springs**  
 Burditt & Williams, Boston, Mass.
- Draw Benches**  
 Richard Mfg. Co., Bloomsburg, Pa.  
 Thompson, Hugh L., Waterbury, Ct.
- Drill Grinders**  
 Beald, L. S. & Son, Barre, Mass.  
 Sellers, Wm. & Co., Inc., Phila., Pa.  
 Washburn Shops of Worcester Polytechnic Inst., Worcester, Mass.
- Drilling Machines**  
 Barnes, R. F. Co., Rockford, Ill.  
 Barnes, W. F. & John Co., Rockford, Ill.  
 Baush Mch. Tool Co., Springfield, Mass.  
 Bement, Miles & Co., Phila., Pa.  
 Bickford Drill & Tool Co., Cin., Ohio.  
 Bullard Machine Tool Co., Bridgeport, Ct.  
 Burnham, Geo. Co., Worcester, Mass.  
 Champion Blower & Forge Co., Lancaster, Pa.  
 Cincinnati Mch. Tool Co., Cincinnati, O.  
 Dallett, Thos. H. & Co., Philadelphia.  
 D'Amour & Littledale Mch. Co., 151 Worth St., N. Y.  
 Davis, W. F., Machine Co., Rochester, N. Y.  
 Detrick & Harvey Mch. Co., Baltimore, Md.
- Foodieck & Holloway Mach. Tool Co., Indiana, O.**
- Harrington, E. Son & Co., Phila., Pa.**
- Hill, Clarke & Co., Boston, Mass.**
- Hoefer Mfg. Co., Freeport, Ill.**
- Prentice Bros., Worcester, Mass.**
- Quint, A. D., Hartford, Conn.**
- Shuster, F. B. Co., New Haven, Conn.**
- Shibler & Ware, So. Bend, Ind.**
- Sigourney Tool Co., Hartford, Conn.**
- Silver Mfg. Co., Salem, O.**
- Slate Dwight Machine Co., Hartford, Ct.**
- Stow Flexible Shaft Co., Phila., Pa.**
- Wiley & Russell Mfg. Co., Greenfield, Mass.**
- York, S. M. Co., Cleveland, O.**
- Drilling Machines, Automatic**  
 Gould & Eberhardt, Newark, N. J.
- Drills, Pneumatic**  
 Chicago Pneumatic Tool Co., Chicago, Ill.
- Drive Chains**  
 Locke Steel Belt Co., Bridgeport, Conn.
- Drop Forgings**  
 Pelden Machine Co., New Haven, Conn.  
 Billings & Spencer Co., Hartford, Conn.  
 Chicago Drop Forging & Fdry. Co., Kensington, Ill.  
 Clapp, E. D. Mfg. Co., Auburn, N. Y.  
 Consolidated Railway Electric Lighting & Equipment Co., 60 Broadway, N. Y.  
 Eccles, Richard, Auburn, N. Y.  
 Indianapolis Drop Forging Co., Indianapolis, Ind.  
 Keystone Drop Forge Co., Philadelphia.  
 Kilborn & Bishop Co., New Haven, Conn.  
 R. I. Tool Co., Providence, R. I.  
 Scranton Forging Co., Scranton, Pa.  
 Seward, M. & Son Co., New Haven, Ct.  
 Springfield Drop Forging Co., Springfield, Mass.  
 Strieby & Foote Co., Newark, N. J.  
 Transue & Williams Co., Alliance, O.  
 Williams, J. H. & Co., Brooklyn, N. Y.  
 Wyman & Gordon, Worcester, Mass.
- Drop Hammers**  
 Billings & Spencer Co., Hartford, Conn.  
 Merrill Bros., Brooklyn, N. Y.  
 Williams, White & Co., Moline, Ill.
- Drop Presses**  
 Manville, E. J. Mch. Co., Waterbury, Ct.  
 Miner & Peck Mfg. Co., New Haven, Ct.  
 Monberg & Granville Mfg. Co., Providence, R. I.  
 Vulcan Iron Works, Chicago, Ill.
- Dumb Waiters**  
 Energy Elevator Co., Philadelphia, Pa.  
 Speidel, J. G., Reading, Pa.  
 Storm Mfg. Co., Newark, N. J.  
 Variety Machine Co., Warsaw, N. Y.
- Dump Cars**  
 Atlas Bolt & Screw Co., Cleveland, O.
- Dynamos**  
 Eddy Electric Mfg. Co., Windsor, Conn.  
 General Electric Co., Schenectady, N. Y.  
 Westinghouse Elec. & Mfg. Co., Pittsburgh, Pa.
- Eave Troughs**  
 Kaueberg Rfg. Co., Canton, O.
- Eave Trough Hangers**  
 Berger Bros. Co., Philadelphia, Pa.  
 Oatman Bros., Medina, O.
- Edge Tools**  
 Buck, Chas., Millbury, Mass.  
 Buck Bros., Millbury, Mass.  
 Ferro-Carbon Castings Co., Phila. Pa.  
 White, L. & J. Co., Buffalo, N. Y.
- Egg Beaters**  
 Lyon, Nelson, Albany, N. Y.  
 Standard Co., Boston, Mass.
- Egg Opener**  
 Hartigan, W. R., Collinsville, Ct.
- Electric Bells and Supplies**  
 Ostrander, W. R. & Co., 204 Fulton St.
- Electric Lighting and Power Apparatus**  
 Eddy Electric Mfg. Co., Windsor, Conn.  
 General Electric Co., Schenectady, N. Y.
- Electrical Apparatus**  
 Westinghouse Elec. & Mfg. Co., Pittsburgh, Pa.
- Elevators, Makers of**  
 Eastern Machinery Co., New Haven, Ct.  
 Energy Elevator Co., Philadelphia, Pa.  
 Link-Belt Engineering Co., Phila., Pa.  
 Morse, Williams & Co., Phila., Pa.  
 Ridgway, Craig & Son Co., Coatesville, Pa.  
 Speidel, J. G., Reading, Pa.  
 Variety Machine Co., Warsaw, N. Y.
- Elevator Buckets**  
 Clark, W. J. & Co., Salem, O.  
 Cleveland Elevator Bucket Co., Cleveland, O.
- Elevator Enclosures and Cabs**  
 Ludlow Saylor Wire Co., St. Louis, Mo.
- Emery**  
 Tanite Co., Stroudsburg, Pa.
- Emery Wheels**  
 American Emery Wheel Works, Providence, R. I.  
 Best, L., 45 Vesey St., N. Y.  
 Bridgeport Safety Emery Wheel Co., Bridgeport, Conn.  
 Buffalo Emery Wheel Co., Buffalo, N. Y.  
 Nazel, John, Phila., Pa.  
 Northampton Emery Wheel Co., Leeds, Mass.  
 Norton Emery Wheel Co., Worcester, Mass.  
 Safety Emery Wheel Co., Springfield, O.  
 Springfield Mfg. Co., Bridgeport, Conn.  
 Sterling Emery Wheel Co., Tiffin, O.  
 Tanite Co., Stroudsburg, Pa.
- Vitrified Emery Wheel Co., Westfield, Mass.**
- Emery Wheel Dresser**  
 Chicago Kew Co., Chicago, Ill.  
 Dickinson, Thos. L., 45 Vesey St., N. Y.
- Enameled Ware**  
 Bellisire Stamping Co., Harvey, Ill.
- Engineers and Contractors**  
 Alken, Henry, Pittsburgh, Pa.  
 Erikson, Edw. E., Pittsburgh, Pa.  
 Filer & Stowell Co., Milwaukee, Wis.  
 Frier-Miller Engineering Co., Pittsburgh, Pa.  
 Hevi & Patterson, Pittsburgh, Pa.  
 Huber, S. V. Co., Pittsburgh, Pa.  
 Kay, G. Ashton, 283 Broadway, N. Y.  
 Kennedy, Julian, Pittsburgh, Pa.  
 Kennedy, Walter, Pittsburgh, Pa.  
 Lamond, David, Pittsburgh, Pa.  
 Laughlin, Alex & Co., Pittsburgh, Pa.  
 McClure, G. W. Son & Co., Pittsburgh.  
 Morgan Construction Co., Worcester, Mass.  
 Penna. Engineering Wks., New Castle, Penna.  
 Riter-Conley Mfg. Co., Pittsburgh, Pa.  
 Smythe, S. K. Co., Inc., Pittsburgh, Pa.  
 Swindell, W. & Bros., Pittsburgh, Pa.  
 Thompson, Hugh L., Waterbury, Ct.  
 Wellman Seaver Engineering Co., Cleveland, O.
- Engines**  
 Gas.  
 Mietz, Aug., 129-138 Mott St., N. Y.  
 Northern Engineering Works, Detroit, Mich.  
 Gasoline.  
 Charter Gas Engine Co., Sterling, Ill.  
 Stover Engine Works, Freeport, Ill.  
 Weber Gas & Gasoline Engine Co., Kansas City, Mo.  
 Watkins, F. M., Cincinnati, O.  
 Kerosene.  
 Mietz, Aug., 129-138 Mott St., N. Y.  
 Steam.  
 Allis, E. P. Co., Milwaukee, Wis.  
 Boston Flower Co., Hyde Park, Mass.  
 Buffalo Forge Co., Buffalo, N. Y.  
 Filer & Stowell Co., Milwaukee, Wis.  
 Newport News Shipbuilding & Dry Dock Co., 1 Broadway, N. Y.  
 Sennet Geo. R. Co., Youngstown, O.  
 Southwick Fdry. & Mch. Co., Philadelphia, Pa.  
 Thirtvnt, B. F. Co., Boston, Mass.  
 Tod, William & Co., Youngstown, O.  
 Totten & Hoeg Iron & Steel Fdry. Co., Pittsburgh, Pa.  
 Wetherill, Robt. & Co., Chester, Pa.
- Engines, Marine**  
 Lake City Engineering Co., Erie, Pa.
- Engines, Second Hand**  
 Everson, R. M., Pittsburgh, Pa.
- Engravers**  
 Musford A., Hartford, Conn.
- Expanding Mandrels**  
 LeCount, Wm. G., So. Norwalk, Conn.
- Expansion Bolts**  
 Church, Isaac Toledo, O.  
 Evans, F. H., Brooklyn, N. Y.  
 McCabe Hanger Mfg. Co., 538-543 W. 23d St., N. Y.  
 Newhall Henry B. Co., N. Y.  
 Seaman, D. C. & Co., Philadelphia, Pa.  
 Steward & Komanie Mfg. Co., Phila., Pa.
- Farmers' Tools**  
 Champion Tool Co., Ltd., Conneaut Lake, Pa.  
 Heller Bros. & Co., Newark, N. J.
- Faucets**  
 McKenna Bros. Brass Co., Ltd., Pittsburgh, Pa.
- Faucets, Wooden**  
 Boston & Lockport Block Co., Boston.  
 Sommer's, John, Son, Newark, N. J.
- Feed Cutters**  
 Silver Mfg. Co., Salem, O.
- Feed Water Heaters and Particlers**  
 Harrisburg Pipe Bending Co., Harrisburg, Pa.  
 Harrison Safety Boiler Works, Philadelphia, Pa.  
 Kelly, R. F. & Son, 91 Liberty St., N. Y.  
 National Pipe Bending Co., New Haven.  
 Nutterson, F. L., 196 Liberty St., N. Y.  
 Taunton Locomotive Mfg. Co., Taunton, Mass.  
 Webster, Warren & Co., Camden, N. J.  
 Whitlock Oil Pipe Co., Hartford, Ct.
- Fencing, Iron and Wire**  
 Adam, W. J., Joliet, Ill.  
 American Steel & Wire Co., Chicago, Ill.  
 Barnum E. T., Detroit, Mich.  
 Clinton Wire Cloth Co., Clinton, Mass.  
 DeKaib Fence Co., DeKalb, Ill.  
 Dwigins Wire Fence Co., Anderson, Ind.  
 Ellis & Halfenbarger, Indianapolis, Ind.  
 Frost Wire Fence Co., Cleveland, O.  
 Gilbert & Bennett Mfg. Co., 42 Cliff St.  
 Hartman Mfg. Co., 39 Broadway, N. Y.  
 Kilmer Wire Mfg. Co., Chicago, Ill.  
 Kokomo Fence Mch. Co., Kokomo, Ind.  
 Ludlow Saylor Wire Co., St. Louis, Mo.  
 Ornamental Iron & Wire Co., Chattanooga, Tenn.  
 Rossman Woven Wire Fence Co., Rossmann, N. Y.  
 Stewart Iron Works, Cincinnati, Ohio.  
 Up-to-date Mfg. Co., Terre Haute, Ind.
- Ferro-Chromium**  
 Willson Aluminum Co., 99 Cedar Street, N. Y.
- Files and Rasps**  
 Manufacturers of  
 Arcade File Works, Anderson, Ind.  
 Barnett, G. & H. Co., 41 & 43 Richmond Phila.  
 Diston, Henry & Sons, Inc., Phila. Pa.  
 Heller Bros. Co., Newark, N. J.  
 McCaffrey File Co., Philadelphia.  
 Nicholson File Co., Providence, R. I.  
 Stokes Bros. Mfg. Co., Freehold, N. J.
- Filters**  
 Scaife, Wm. B. & Sons, Pittsburgh, Pa.

**Finished Castings**

Franklin, H. H. Mfg. Co., Syracuse.

**Fire Brick**

Borgner, Cyrus, Philadelphia, Pa.  
Gardner Bros., Cumberland, Md.  
Haws, W. H. Fire Brick Co., Mt. Union.  
Maurer, H. & Son, 420 E. 23d, N. Y.  
Ostrander Fire Brick Co., Troy, N. Y.  
Presbury Fire Brick Co., Taunton, Mass.  
Staten Island Clay Co., Woodbridge.  
Valentine, M. D. & Bro. Co., Woodbridge.

**Fishing Tackle**

Dane, Stoddard &amp; Co., Boston, Mass.

**Flanged Fittings**

Latrobe Steel Co., Phila., Pa.

**Flexible Shafting**

Chicago Flexible Shaft Co., Chicago, I. I.  
Stow Flexible Shaft Co., Phila., Pa.  
Stow Mfg. Co., Binghamton, N. Y.

**Flint and Emery Paper**

Baeder, Adamson &amp; Co., Phila., Pa.

**Floor and Ceiling Plates**

Coddling Mfg. Co., Bristol, Conn.

**Flue Cleaners**

Jackson Flue Scraper Co., Jackson  
Jarecki Mfg. Co., Erie, Pa.

**Fly Killers**

Rigelow, J. F., Worcester, Mass.  
Montgomery, R. R. & Co., Decatur, Ill.

**Foot Power Emery Wheels**

Buffalo Emery Wheel Co., Buffalo, N. Y.

**Foot Rests**

Star Heel Plate Co., Newark, N. J.

**Forges, Portable, &c.**

Bradley Co., Syracuse, N. Y.  
Champion Blower & Forge Co., Lancaster, Pa.  
Sturtevant, B. F. Co., Boston, Mass.

**Forgings, Iron and Steel**

Baker, Jas. H. Mfg. Co., Pittsburgh, Pa.  
Bethlehem Steel Co., Bethlehem, Pa.  
Eastern Forge Co., Boston, Mass.  
Frankford Steel Co., Phila., Pa.  
Hay-Budden Mfg. Co., Brooklyn, N. Y.  
Otis Steel Co., Ltd., Cleveland, Ohio.  
Pittsburgh Shear, Knife & Machine Co., Pittsburgh, Pa.  
Titusville Forge Co., Titusville, Pa.  
U. S. Projectile Co., Brooklyn, N. Y.

**Forks, Hay and Manure**

Continental Tool Co., Frankfort, N. Y.  
Iowa Farming Tool Co., Ft. Madison, Ia.  
Withington & Cooley Mfg. Co., Jackson.

**Foundry Facings**

Obermayer, S. Co., Cincinnati, O.

**Foundry Lamps**

Forest City Fdy. &amp; Mfg. Co., Cleveland.

**Foundry Supplies**

Gilmour, J., Bennett Building, N. Y.  
Obermayer, S. Co., Cincinnati, Ohio.  
Osborn Mfg. Co., Cleveland, O.  
Paxson, J. W. Co., Phila., Pa.

**Four-Head Milling Machines**

Ingersoll Milling Machine Co., Rockford, Ill.

**Friction Clutches**

Eastern Machinery Co., New Haven, Ct.  
Hess, Snyder & Co., Maestlin, O.

**Furnaces, Oil, Gas and Coal**

Rockwell Engineering Co., 26 Cortlandt St., N. Y.

**Fuses**

Ensign Bickford &amp; Co., Simsbury, Ct.

**Gages**

Crosby Steam Gage &amp; Valve Co., Boston.

**Galvanized Ware**

Keen &amp; Hagerty Mfg. Co., Baltimore.

**Galvanizing**

Blackman & King, 801 Greenwich St., N. Y.  
Empire Pipe Rending & Supply Co., Brooklyn, N. Y.

**Galvanizing Process**

U. S. Electro Galvanizing Co., 348 Broadway, N. Y.

**Garden Rakes**

Jenkins Iron &amp; Tool Co., Howard, Pa.

**Garden Tools**

Withington &amp; Cooley Mfg. Co., Jackson.

**Gas Compositometer**

Uehling, Steinbart &amp; Co., Ltd. Carlstadt, N. J.

**Gas Compressors**

Norwalk Iron Works Co., So. Norwalk, N. Y.

**Gas Furnaces**

Am. Gas Furnace Co., 23 John St., N. Y.  
Chicago Flexible Shaft Co., Chicago, Ill.

**Gaskets**

Canfield, H. O., Bridgeport, Conn.

**Gaskets, Iron**

Smith &amp; Co. Mfg. Co., Jersey City, N. J.

**Gas Producers**

Duff Patent Co., Allegheny, Pa.  
Smith, S. R. Co., Inc., Pittsburgh, Pa.  
Swindell, W. & Bro., Pittsburgh, Pa.

**Gauges, Rolling Mill**

Haines Gauge Co., Philadelphia, Pa.

**Gears**

Boston Gear Works, Boston, Mass.  
Gleason Tool Co., Rochester, N. Y.  
Morse, Williams & Co., Phila., Pa.  
Nuttall, R. D. Co., Pittsburgh, Pa.  
Poole, Robt. Son & Co., Baltimore, Md.

**Gears, Rawhide**

Horsburgh &amp; Scott, Cleveland, Ohio.

**Gear Cutters**

Becker Brinard Milling Machine Co., Hyde Park, Mass.  
Gould & Eberhardt, Newark, N. J.  
Whitton, D. E. Mch. Co., New London.

**Generators, Electric**

W. Atchamse Elec. &amp; Mfg. Co., Pittsburgh, Pa.

**Gimlets**

No. 10 Mfg. Co., Chester, Conn.

**Glass Cutters**

Barrett, W. L., Bristol, Conn.  
Bultman, F. H. & Co., Cleveland, O.  
Monce, S. G., Unionville, Conn.  
Smith & Hemenway Co., 296 Broadway, N. Y.

**Glass Cutting Boards**

Lufkin Rule Co., Saginaw, Mich.

**Glue**

Baeder, Adamson &amp; Co., Phila., Pa.

**Golf Goods**

Bridge-ort Gun Implement Co., 512 Broadway, N. Y.

**Grates, Rocking**

Sennett, Geo. E. Co., Youngstown, O.

**Grease, Axle**

Snow Flake Axle Grease Co., Boston.

**Grinding and Polishing Mchs.**

American Emery Wheel Works, Providence, R. I.

Barnes, W. F. &amp; John Co., Rockford, Ill.

Besly, Chas. H. &amp; Co., Chicla, O., Ill.

Brown &amp; Sharpe Mfg. Co., Providence.

Builders Iron Foundry, Providence, R. I.

Cincinnati Milling Mach. Co., Cincinnati, O.

Gorton, Geo. Mach. Co., Racine, Wis.

Landis Tool Co., Waynesboro, Pa.

Northampton Emery Wheel Co., Leeds, Mass.

Norton Emery Wheel Co., Worcester, Mass.

Safety Emery Wheel Co., Springfield, O.

Springfield Mfg. Co., Bridgeport, Conn.

Tanite Co., Stroudsburg, Pa.

Universal Mach. Co., Providence, R. I.

**Grindstones**

Cleveland Stone Co., Cleveland, O.

**Grubbing Machine**

New Century Mfg. Co., 43 E. 8th St., N. Y.

**Guns**

Harrington &amp; Richardson Arms Co., Worcester, Mass.

Johnson, Iver Arms &amp; Cycle Works, Fitchburg, Mass.

Marlin Fire Arms Co., New Haven, Ct.

Remington Arms Co., 815 Broadway, New York

**Gymnasium Apparatus**

Narragansett Ach. Co., Providence, R. I.

**Hack Saws**

Disston, Henry &amp; Sons, Inc., Phila., Pa.

Goodell-Pratt Co., Greenfield, Mass.

Springfield Machine Screw Co., Springfield, Mass.

Starrett, L. S. Co., Athol, Mass.

**Hack Saw Machines**

Millers Falls Co., 28 Warren St., N. Y.

**Hammer Mold**

Field, C. H., Providence, R. I.

**Hammers**

Heller Bros. Co., Newark, N. J.

Logan &amp; Strobbridge Iron Co., New Brighton, Pa.

**Hammers, Pneumatic**

Chicago Pneumatic Tool Co., Chicago.

**Hammocks**

Pomer, L. E., Middletown, Conn.

Bicknell Bdw. Co., Janesville, Wis.

**Hand Milling Machines**

Costilo, J. E. Machine Wks., Brooklyn.

**Hand Screws**

Bliss, R. Mfg. Co., Pawtucket, R. I.

**Handle Machinery**

Defiance Machine Works, Defiance, O.

**Handles**

Piqua Handle &amp; Mfg. Co., Piqua, O.

**Hangers, Barn Door**

Myers, F. E. &amp; Bro., Ashland, O.

**Hangers, Door**

Conover Trolley Track Mfg. Co., Holyoke, Mass.

Cronk Hanger Co., Elmira, N. Y.

Lane Bros., Poughkeepsie, N. Y.

Lawrence Bros., Sterling, Ill.

Louden Machinery Co., Fairfield, Iowa.

McCabe Hanger Mfg. Co., 533-543 W. 22d St., N. Y.

McKinney Mfg. Co., Allegheny, Pa.

Ney Mfg. Co., Canton, Ohio.

Stowell Mfg. &amp; Foundry Co., So. Milwaukee, Wis.

Wilcox Mfg. Co., Aurora, Ill.

**Hangers, Shafting**

Ball Bearing Co., Boston, Mass.

Dodge Mfg. Co., Mishawaka, Ind.

**Hardware Comm'n Merchants**

Graham, Jno. H. &amp; Co., 113 Chambers St., N. Y.

Hungerford, U. T., Brass &amp; Copper Co., 121 Worth St., N. Y.

**Hardware Manufacturers**

Arcade Mfg. Co., Freeport, Ill.

Central Hardware Co., Phila.

Logan &amp; Strobbridge Iron Co., New Brighton, Pa.

Millers Falls Co., 28 Warren St., N. Y.

Ney Mfg. Co., Canton, Ohio.

Nicol &amp; Co., Chicago, Ill.

Parker, Chas. Co., Meriden, Conn.

Peck, Stow &amp; Wilcox Co., 21 Murray St., N. Y.

Shepard, Sidney &amp; Co., Buffalo, N. Y.

Stanley Works, New Britain, Conn.

Union Mfg. Co., 108 Chambers St., N. Y.

Van Wagoner &amp; Williams Hdw. Co., Cleveland, O.

Wrightsville Hdw. Co., Wrightsville, Pa.

**Hardware Mfrs., Agents**

Graham, John H. &amp; Co., 113 Chambers St., N. Y.

Wiebusch &amp; Hilger, Ltd., 9-15 Murray St., N. Y.

**Hardware Shelving**

Warren, J. D. Mfg. Co., Chicago, Ill.

**Hardware Specialties**

Aome Shear Co., Bridgeport, Conn.

Bergner Bros. Co., Philadelphia, Pa.

Enterprise Mfg. Co., of Pa., Phila., Pa.

Graham, John H. &amp; Co., 113 Chambers St., N. Y.

Pleuger &amp; Henger Mfg. Co., St. Louis.

Scranton &amp; Co., The, New Haven, Ct.

Smith &amp; Egge Mfg. Co., Bridgeport, Ct.

Smith &amp; Hemenway Co., 296 Broadway, N. Y.

**Harness Snaps**

Covert Mfg. Co., West Troy, N. Y.

Covert's Saddlery Wks., Farmer, N. Y.

Imperial Bit &amp; Snap Co., Racine, Wis.

**Haps and Staples**

McKinney Mfg. Co., Allegheny, Pa.

**Haichets**

Jensins Iron &amp; Tool Co., Howard, Pa.

**Hay Knives**

Clark &amp; Parsons Co., E. Wilton, Me.

Indiana Edge Tool Co., Gas City, Ind.

Ney Mfg. Co., Canton, Ohio.

**Hay Tools**

Louden Machinery Co., Fairfield, Iowa.

Ney Mfg. Co., Canton, O.

**Heating and Ventilating Apparatus**

American Blower Co., Detroit, Mich.

Bavley, Wm. &amp; Sons Co., Milwaukee, Wis.

Boston Blower Co., Hyde Park, Mass.

Buffalo Forge Co., Buffalo, N. Y.

Pervina, R. F. &amp; Son, Holyoke, Mass.

Sturtevant, B. F. Co., Boston, Mass.

**Heel Plates**

Star Heel Plate Co., Newark, N. J.

**Hinges**

Jenkins Iron &amp; Tool Co., Howard, Pa.

Lawrence Bros., Sterling, Ill.

McKinney Mfg. Co., Allegheny, Pa.

Stanley Works, New Britain, Conn.

Tiebout, W. J., 118 Chambers St., N. Y.

**Hitching Posts**

Hartman Mfr. Co., 309 Broadway, N. Y.

**Hoes, Garden, Planters, &c.**

Continental Tool Co., Frankfort, N. Y.

Iowa Farming Tool Co., Fort Madison.

Jenkins Iron &amp; Tool Co., Howard, Pa.

**Holsts, Air**

Pedrick &amp; Ayer Co., Philadelphia, Pa.

Ridgway, Craig &amp; Son Co., Coatesville, Pa.

**Holsts, Chain and Rope**

Box, Alfred &amp; Co., Philadelphia, Pa.

Eckstein, C. G., 249 Centre St., N. Y.

Fulton Iron &amp; Engine Works, Detroit, Mich.

Harrington, E. Son &amp; Co., Phila., Pa.

McClary, Jos. F. &amp; Co., 36 Warren St.

Reading Crane &amp; Hoist Works, Reading, Pa.

Speidel, J. G., Reading, Pa.

**Holding Machines**

Eastern Machinery Co., New Haven, Ct.

Lidgerwood Mfg. Co., 90 Liberty St., N. Y.

**Hollow Mill**

Geometric Drill Co., Westville, Conn.

**Hollow Ware**

Avery Stamping Co., Cleveland, Ohio.

Cleveland Stamping &amp; Tool Co., Cleveland, O.

New York Stamping Co., Brooklyn, N. Y.

Rogers, Jno. M. Boat-Gauge &amp; Drill Works, Gloucester, City, N. J.

**Horse Nails**

Capewell Horse Nail Co., Hartford, Ct.

Mooney, W. M. &amp; Co., Ausable Chasm, N. Y.

National Horse Nail Co., Vergennes, Vt.

Putnam Nail Co., Neponset, Boston.

Wiebusch &amp; Hilger, Ltd., 9-15 Murray St., N. Y.

**Horse and Mule Shoes**

American Steel &amp; Wire Co., Chicago, Ill.

Burden Iron Co., Troy, N. Y.

Phoenix Horse Shoe Co., Poughkeepsie, Rhode Island Perkins Horse Shoe Co., Providence, R. I.

**Horseshoe Studs**

Leonhart &amp; Co., Berlin, Schoneberg, Germany.

**Hose**

Boston Belting Co., Boston, Mass.

Peerless Rubber Mfg. Co., 16 Warren Street, New York.

**Hose Couplings**

Clark, W. J. &amp; Co., Salem, Ohio.

**Hose Coupling, Air**

Pedrick &amp; Ayer Co., Philadelphia, Pa.

**Hose Washers**

Canfield, H. O., Bridgeport, Conn.

**House Furnishing Specialties**

Lloyd Mfg. Co., Minneapolis, Minn.

Williams, A. C. Ravenna, O.

**Hydraulic Jacks**

Dudgeon, Richard, 24 Columbia St., N. Y.

Penderer, A. L. Sons, Wilmington, el.

Watson-Stillman Co., 204 E. 43d St., N. Y.

**Hydraulic Machinery**

Watson-Stillman Co., 204 E. 43d St., N. Y.

**Hydraulic Presses**

Cornell, J. B. &amp; J. M., 28th St. and 11th Ave., N. Y.



**Logging Tools**

Gerlach, Peter &amp; Co., Cleveland, Ohio.

**Lubricants**Dixon, Jos. Crucible Co., Jersey City  
Snow Flake Axle Grease Co., Boston.**Lumbering Tools**

Morley Bros., Saginaw, Mich.

**Lunch Boxes**

Seavey Mfg. Co., Boston, Mass.

**Machinery**

Acme Machinery Co., Cleveland, Ohio.

Atteck, Geo. E., 109 Lib. rty st., N. Y.

A-Jax Mfg. Co., Cleveland, Ohio.

American Tool Wks. Co., Cincinnati, O.

Balrd, U. Machinery Co., Pittsburgh, Pa.

Barnea, W. F. &amp; John Co., Rockford, Ill.

Baugh Mch. Tool Co., Springfield, Mass.

Becker-Brainerd Milling Mach. Co.,  
Hyde Park, Mass.

Bliss E. W. Co., Brooklyn, N. Y.

Bowler, Geo. H., Cleveland, O.

Briggs, Marvin, 15 Broadway, N. Y.

Brown &amp; Sharpe Mfg. Co., Providence.

Bullard Mch. Tool Co., Bridgeport, Ct.

Carlin Machinery & Supply Co., Alle-  
gheny, Pa.

Carlin's Sons Thos., Allegheny, Pa.

Cincinnati Milling Mach. Co., Cin. O.

Cornell, J. B. & J. M., 26th St. and 11th  
Ave., New York City.

Davis, W. P. Machine Co., Rochester, N. Y.

Dawson, A. L. &amp; Co., Chicago, Ill.

Detrick &amp; Harvey Mch. Co., Baltimore, Md.

Diamond Drill &amp; Mch. Co., Birdsboro, Pa.

Doan, J. B. &amp; Co., Chicago, Ill.

Draper Mach. Tool Co., Worcester, Mass.

Du Bois Iron Works, Du Bois, Pa.

Farrel Fdry &amp; Mch. Co., Ansonia, Conn.

Ferracute Machine Co., Bridgeport, N. J.

Fish, H. C. Machine Works, Worcester, Mass.

Garvin Machine Co., Spring and Varick  
Sta. N. Y.

General Supply Co., 40 John St., N. Y.

Geometric Drill Co., Westville Conn.

Gray, Robt. J., 524 E. 132d St., N. Y.

Hannan &amp; Union, Springfield, Mass.

Harris Mach'y Co., Minneapolis, Minn.

Hendey Machine Co., Torrington, Conn. Hill, Henry F., Boston, Mass.

Hill, Clarke &amp; Co., Boston, Mass.

Johnson, Israel H., Jr., &amp; Co., Phila.

Johnson, Wm. C. &amp; Sons Mch. Co., St. Louis, Mo.

Kaiser, A. V. &amp; Co., Phila., Pa.

Lodge &amp; Shipley Mch. Tool Co., Cin., O.

Lund, S. T., Boston, Mass.

McCabe, J. J., 14 Day Street, N. Y.

McDowell &amp; Co., Pittsburgh, Pa.

McDowell Stocker &amp; Co., Chicago.

Machinery Supply Co., Rochester, N. Y.

Manning, Maxwell & Moore, 85-89 Lib-  
erty St., N. Y.

Manville, E. J. Mach. Co., Waterbury, Ct.

Marshall & Hushart Mch'y Co., Chi-  
cago, Ill.

Mossberg, Frank Co., Attleboro, Mass.

National Machine-y Co., Tiffin, Ohio.

New Doty Mfg. Co., Janesville, Wis.

New Haven Mfg. Co., New Haven, Conn.

New York Machinery Depot, 175 Broad-  
way, New York.Niles Tool Works Co., 138 Liberty  
St., N. Y.

Nilson, A. H. Mch. Co., Bridgeport, Ct.

Paradox Machinery Co., Chicago, Ill.

Pennsylvania Machine Co., Phila., Pa.

Phila. Machine Tool Co., Phila., Pa.

Pittsburgh Mfg. Co., Pittsburgh, Pa.

Pond Machine Tool Co., Plainfield, N. J.

Poole, Robt. &amp; Son Co., Baltimore, Md.

Potter &amp; Johnston Co., Pawtucket, R. I.

Poulterer &amp; Co., Phila., Pa.

Pratt &amp; Whitney Co., Hartford, Conn.

Prentice Bros., Worcester, Mass.

Prentiss Tool & Supply Co., 115 Liberty  
St., N. Y.

Rainer &amp; Williams, Chicago, Ill.

Reade, Wm. A., Weyland, O.

Reyert's Sons, L. F., Philadelphia, Pa.

Sigourney Tool Co., Hartford, Conn.

Thomas & Lowe Machinery Co., Provi-  
dence, R. I.

Toomey, Frank, Philadelphia, Pa.

Waterbury Farrel Foundry & Mch. Co.,  
Waterbury, Conn.

Wetherill Robert &amp; Co., Chester, Pa.

Windor Machine Co., Windsor, Vt.

Wisconsin Machinery Co., Milwaukee, Wis.

Wormer, C. O. Mch'y Co., Detroit, Mich.

York, S. M. Co., Cleveland, O.

**Machinery, Wood Working**

American Mach'y Co., Grand Rapids,

Defiance Machine Wks., Defiance, O.

Fay, J. A. &amp; Egan Co., Cincinnati, O.

**Machinery Springs**

Scott, Chas. Spring Co., Phila., Pa.

**Machinery Builders**

Chapman, J. B. &amp; Co., Springfield, Mass.

U. S. Projectile Co., Brooklyn, N. Y.

**Machine Screws—See Screws, Machine****Machine Screw Work**Spencer Automatic Mch. Screw Co.,  
Hartford, Conn.**Machine Tools—See Machinery****Machine Work**

Nuttall, R. D. O., Pittsburgh, Pa.

**Machine Wrenches**

Billings &amp; Spencer Co., Hartford Conn.

**Machinists' Scales**

Starratt, L. S. Co., Athol, Mass.

**Machinists' Tools and Supplies**

Billings &amp; Spencer Co., Hartford, Conn.

General Supply Co., 40 John St., N. Y.

Keystone Mfg. Co., Buffalo, N. Y.

King, J. M. &amp; Co., Watford, N. Y.

**Magnetic Separators**

Cresson, Geo. V. Co., Phila., Pa.

**Manganese Bronze**Hungerford, U. T. Brass & Copper Co.,  
121 Worth St., N. Y.**Manufacturing Properties**

Hillman, J. H. &amp; Co., Pittsburgh, Pa.

**Manufacturing Sites**Chicago, Milwaukee & St. Paul R. R.,  
Chicago, Ill.Southern Railway Co., Washington,  
D. C.**Measuring Machines**Rogers, Jno. M. Bos\*, Gauge & Drill  
Wks., Gloucester City, N. J.**Metal Choppers**

Brown, Chas. J., 160 Duane St., N. Y.

Enterprise Mfg. Co. of Pa., Phila., Pa.

Peck, Stow & Wilcox Co., 27 Murray St.,  
New York.

Streeter, N. R. &amp; Co., Rochester, N. Y.

Woodruff, O. D., Potstow, Pa.

**Metal Brokers**

American Metal Co., 52 Broadway, N. Y.

**Metals**

Hendricks Bros., 49 Cliff St., N. Y.

Hofeller, Theo. &amp; Co., Buffalo, N. Y.

Hungerford, U. T. Brass & Copper Co.,  
121 Worth St., N. Y.

Rutter, A. T., 256 Broadway, N. Y.

United Metals Selling Co., 11 Broadway,  
N. Y.**Metal Polish**

Hoffman, Geo. W., Indianapolis, Ind.

**Metal Spinning**

Goodwin &amp; Kints Co., Winsted, Conn.

**Milling Machines**

Acme Mch. Co., Dubuque, Iowa.

Becker-Brainerd Milling Machine Co.,  
Hyde Park, Mass.

Brown &amp; Sharpe Mfg. Co., Providence.

Carter &amp; Hakes Mach. Co., Winsted, Ct.

Cincinnati Milling Mach. Co., Cin., O.

Fox Machine Co., Grand Rapids, Mich.

Garvin Machine Co., Spring and Varick  
Sta., N. Y.Ingersoll Milling Mach. Co., Rockford,  
Niles Tool Works Co., 136-138 Liberty  
St., N. Y.

Shuster, F. B. Co., New Haven, Conn.

Thurston Mfg. Co., Providence, R. I.

**Mining Knives**

Bishop, Geo. H. &amp; Co., Cincinnati, O.

Palmer Hdw. Mfg. Co., Troy, N. Y.

**Mining Machinery**

Allis, E. P. Co., Milwaukee, Wis.

Rand Drill Co., 100 Broadway, N. Y.

**Mining Screens**Harrington & King Perforating Co.,  
Chicago, Ill.

Howard &amp; Morse, 45 Fulton St., N. Y.

Michigan Wire Cloth Co., Detroit, Mich.

**Miter Boxes**

Thomson Bros. &amp; Co., Lowell, Mass.

**Molding Machines**

Adams Co., Dubuque, Iowa.

Maywood Fdry. &amp; Mch. Co., Chicago.

**Motor Fans**Hungerford, U. T. Brass & Copper Co.,  
121 Worth St., N. Y.**Motors, Air**

Stow Flexible Shaft Co., Phila., Pa.

**Motors, Electric**

Eddy Electric Mfg. Co., Windsor, Conn.

General Electric Co., Schenectady, N. Y.

Sturtevant, B. F. Co., Boston, Mass.

Westinghouse Elec. & Mfg. Co., Pitts-  
burgh, Pa.**Nail Clippers**

Cook, H. C. Co., Ansonia, Conn.

**Nail Machinery**

Pittsburgh Mfg. Co., Pittsburgh, Pa.

**Nail Pullers**

Bridgeport Mfg. Co., Bridgeport, Conn.

Hagen &amp; Reid, Troy, N. Y.

Scranton &amp; Co., The, New Haven, Conn.

Snow, L. T., New Haven, Conn.

**Name Plates, Machinery**

Murdoch Parlor Gate Co., Boston, Mass.

**Natural Gas Pumps**

Norwalk Iron Wks. Co., So. Norwalk, Ct.

**Nickel Platers' Supplies**

Eddy Electric Mfg. Co., Windsor, Conn.

**Nickeloid**

American Nickeloid Co., Peru, Ill.

**Norway Shapes**Rowland, William & Harvey, Frank-  
ford, Philadelphia.**Nuts—See Bolts****Nuts, Self-Locking**National Elastic Nut Co., Milwaukee,  
Wis.**Nut Machines**

Dunham Nut Co., Unionville, Conn.

**Oil Burners**Burns H.oro-Carbon Burner Co., Fort  
Palo, N. Y.**Oil Burning Appliances**Rockwell, Engineering Co., 26 Cortlandt  
St., N. Y.**Oil Extractor**Reed & Curtis Mch. Screw Co., Worces-  
ter, Mass.**Oil Heaters—See Oil Stoves.****Oil Stones**

Pike Mfg. Co., Pike Station, N. H.

**Oil Stoves—(See Stoves Oil, Vapor and  
Gasoline)****Oilers**

Gem Mfg. Co., Pittsburgh, Pa.

Hammer &amp; Co., Branford, Conn.

Stoutenburg Mfg. Co., Keltzburg, Ill.

Wilmot & Hobbs Mfg. Co., Bridgeport,  
Conn.**Oilless Bearings**North American Metalline Co., Long  
Island City, N. Y.**Ore Breakers**

Aultman Co., Canton, O.

Cresson, Geo. V. Co., Phila., Pa.

**Ores**

Blair, Reed F. Co., Pittsburgh, Pa.

Samuel, Frank, Philadelphia, Pa.

Wister, Francis, Philadelphia, Pa.

**Ox Shoes**

Scranton Forging Co., Scranton, Pa.

Woodruff, Walter W. & Sons, Mt. Car-  
mel, Conn.**Packing**

Boston Belting Co., Boston, Mass.

Morrison, Robert, St. Louis, Mo.

Peerless Rubber Mfg. Co., 16 Warren  
Street, N. Y.**Packing, Iron**

Smooth On Mfg. Co., Jersey City, N. J.

**Padlocks**Graham, John H. & Co., 113 Chambers  
Street, New York.**Paints**

Dixon, Jos. Crucible Co., Jersey City.

**Pants Stretcher**

Covert Mfg. Co., West Troy, N. Y.

**Patent Solicitors**Goepel & Raegener, 200 Broadway,  
N. Y.Howson & Howson, Philadelphia and  
Washington.

Stocking, E. B., Washington, D. C.

**Patterns**

Balkwill Pattern Wks., Cleveland, O.

Norwalk Pattern & Mfg. Co., So. Nor-  
walk, Conn.Mt. Vernon Pattern & Model Works,  
Mt. Vernon, O.**Pattern Letters**

Rutler, A. G., 103 Beekman St., N. Y.

St. Louis Electrotyp Foundry, St. Louis

**Pattern Makers**

Birbaum, C., Cleveland, O.

**Perforated Metal**

Clinton Wire Cloth Co., Clinton, Mass.

Harrington & King Perforating Co., Chi-  
cago, Ill.Hungerford, U. T. Brass & Copper Co.,  
121 Worth St., N. Y.**Phosphor Bronze**Hungerford, U. T. Brass & Copper Co.,  
121 Worth St., N. Y.Phosphor Bronze Smelting Co., Limited,  
Philadelphia.**Phosphor Tin**Prestent Phosphorized Metal Co., Phila-  
delphia, Pa.

Halk &amp; Naumann, 515 Pearl St., N. Y.

Syracuse Smelting Wks., Syracuse, N. Y.

**Picture Wire**

Osswan Mills Co., Norwich, Conn.

**Pig Casting Machines**

Reyl &amp; Patterson, Pittsburgh, Pa.

**Pig Iron**Alabama Consolidated Coal & Iron Co.,  
Birmingham, Ala.

Ashland Steel Co., Ashland, Ky.

Bairst, C. H. &amp; Co., Phila., Pa.

Cherry Valley Iron Co., Pittsburgh, Pa.

Dimmick, J. K. &amp; Co., Phila., Pa.

Hickman, Williams &amp; Co., Chicago, Ill.

Houston, C. B. &amp; Co., Philadelphia, Pa.

Nicoli, B. &amp; Co., 59-6 Wall St., N. Y.

Samuel, Frank, Philadelphia, Pa.

Sloss-Sheffield Steel & Iron Co., Bir-  
mingham, Ala.

Snyder, W. A. &amp; Co., Pittsburgh, Pa.

Superior Charcoal Iron Co., Grand Rap-  
ids, Mich.Tennessee Coal, Iron & R. R. Co., Bir-  
mingham, Ala.Virginia Iron, Coal and Coke Co., Bris-  
tol, Va.—Tenn.**Pig Iron Analysis**

Church, S. H., San Francisco, Cal.

**Pig Iron Storage**Am. Pig Iron Storage Warrant Co., 4  
Wall St., N. Y.**Pig Lead**

Penna. Smelting Co., Pittsburgh, Pa.

**Pile Drivers**

Vulcan Iron Works, Chicago, Ill.

**Pincers**

Washington Tool Co., Owatonna, Wis.

## &lt;

**Razor Blades**

Pike Mfg. Co., Pike Station, N. H.

**Reamers**

Morse Twist Drill &amp; Mch. Co., New Bedford, Mass.

**Recording Gauges**

Bristol Co., Waterbury, Conn.

Uehling, Steinbart &amp; Co., Ltd., Carlstadt, N. J.

**Reels**

Hendryx, A. B. Co., New Haven, Conn.

**Refrigerating Machinery**

York Mfg. Co., York, Pa.

**Refrigerators**

Maine Mfg. Co., Nashua, N. H.

**Registers**

Seaver Mfg. Co., Boston, Mass.

Stowell Mfg. &amp; Foundry Co., So. Milwaukee, Wis.

**Relaying Rails**

Donaldson Newton, Phila., Pa.

Joseph Iron Co., Cincinnati, O.

May &amp; Spalding, 32 Broadway, N. Y.

Steel Rail Supply Co., 100 B'way, N. Y.

**Reloading Tools**

Bridgeport Gun Implement Co., 313-315 Broadway, N. Y.

Hungerford, U. T., Brass &amp; Copper Co., 121 Worth St., N. Y.

Ideal Mfg. Co., New Haven, Conn.

**Repairing Sets, Family**

Mitchell, W. B. Chicago, Ill.

Schrayer, M. Sons &amp; Co., Chicago, Ill.

Star Heel Plate Co., Newark, N. J.

**Repair Outfits, Farmers'**

Imperial Bit &amp; Snap Co., Racine, Wis.

**Revolution Counters**

Pittkin, A. B., Machy, Co., Providence.

Tabor Mfg. Co., Elizabeth, N. J.

**Revolvers**

Harrington &amp; Richardson Arms Co., Worcester, Mass.

Johnson, Iver, Arms &amp; Cycle Works, Fitchburg, Mass.

**Rifles**

Marlin Fire Arms Co., New Haven, Ct.

Remington Arms Co., 315 B'way, N. Y.

Stevens Arms &amp; Tool Co., Chicopee Falls, Mass.

**Ring Rollers**

Shuster, F. B. Co., New Haven, Conn.

**Riveters**

Phila. Pneumatic Tool Co., Phila., Pa.

Riveters, Pneumatic

Chicago Pneumatic Tool Co., Chicago.

**Rivets**

American Iron &amp; Steel Mfg. Co., Lebanon, Pa.

American Screw Co., Providence, R. I.

Blake &amp; Johnson, Waterbury, Conn.

Burden Iron Co., Troy, N. Y.

Clark &amp; Cowles, Plainville, Conn.

Cobb &amp; Drew, Plymouth, Mass.

Hungerford, U. T., Brass &amp; Copper Co., 121 Worth St., N. Y.

McInnes, C. E. &amp; Co., Phila., Pa.

Plymouth Mills, Plymouth, Mass.

Rockford Bolt Works, Rockford, Ill.

Townsend C. O. &amp; E. F., New Brighton Pa.

**Riveting Machines**

Bethlehem Foundry &amp; Mch. Co., So. Bethlehem, Pa.

Shuster, F. B. Co., New Haven, Conn.

**Roadsters and Buses**

Shepard, Sidney &amp; Co., Buffalo, N. Y.

**Roll Mill Machinery**

Bradcock Machine &amp; Mfg. Co., Brad-dock Pa.

Morgan Construction Co., Worcester, Mass.

**Roll Turning Tools**

Tretlowey, Sam'l &amp; Co., Ltd., Pittsburgh

**Roll Bearings**

Roll Bearing Co., Boston, Mass.

Mossberg &amp; Granville Mfg. Co., Providence, R. I.

**Rolling Mill Machinery**

Booth, The Lloyd Co., Youngstown, O.

Everson, B. M., Pittsburgh, Pa.

Farrell Fdry. &amp; Mch. Co., Ansonia, Ct.

Frank-Kneeland Mach. Co., Pittsburgh.

Mesta Machine Co., Pittsburgh, Pa.

Morgan Construction Co., Worcester, Mass.

Mossberg &amp; Granville Mfg. Co., Providence, R. I.

Penna. Engineering Wks., New Castle, Penna.

Totten &amp; Hogg Iron &amp; Steel Fdry. Co., Pittsburgh, Pa.

**Rolls, Chilled, Sand and Steel**

Booth, The Lloyd Co., Youngstown, O.

Farrell Fdry. &amp; Mch. Co., Ansonia, Ct.

Frank-Kneeland Mach. Co., Pittsburgh.

Mesta Machine Co., Pittsburgh, Pa.

Phila. Roll &amp; Mch. Co., Philadelphia, Pa.

Seaman, Slesch Co., Pittsburgh.

Totten &amp; Hogg Iron and Steel Fdry. Co., Pittsburgh, Pa.

Youngstown Foundry &amp; Machine Co., Youngstown, O.

**Roofing and Siding**

Asphalt Ready Roofing Co., 136 Water St., N. Y.

Garry Iron &amp; Steel Roofing Co., Cleveland, O.

Kanneberg Roofing Co., Canton, O.

Scaife, Wm. B. &amp; Sons, Pittsburgh.

Youngstown Iron &amp; Steel Roofing Co., Youngstown, O.

**Rope and Cordage**

American Mfg. Co., 65 Wall St., N. Y.

Waterbury Rope Co., 60 South St., N. Y.

Rope and Web Goods

Covert Mfg. Co., West Troy, N. Y.

Rope Shield

Ironides Co., Columbus, Ohio.

Rope Transmission and Hoisting

American Mfg. Co., 65 Wall St., N. Y.

California Wire Works, San Francisco.

Hunt, C. W. Co., West New Brighton, N. Y.

Leechen, A. &amp; Sons, Rope Co., St. Louis.

Woods, T. B. Sons, Chambersburg, Pa.

**Rubber Goods**

Boston Belting Co., Boston, Mass.

Canfield, H. O., Bridgeport, Conn.

Pearless Rubber Mfg. Co., 16 Warren Street, N. Y.

**Rubber Stamps**

Hoffler, Theo. &amp; Co., Buffalo, N. Y.

**Rules**

Larkin Rule Co., Saginaw, Mich.

Stanley Rule &amp; Level Co., 29 Chambers St., N. Y.

**Sad Irons**

Enterprise Mfg. Co., Phila., Pa.

Williams, A. C., Ravenna, O.

**Sand Blast Apparatus**

Ward, Edgar T. &amp; Sons, Boston, Mass.

**Sand Paper**

Baeder, Adamson &amp; Co., Phila., Pa.

**Sash Balances**

Caldwell Mfg. Co., Rochester, N. Y.

Pullman Sash Balance Co., Rochester, N. Y.

Street, N. R. &amp; Co., Rochester, N. Y.

**Sash Cords and Chains**

Bridgeport Chain Co., Bridgeport, Conn.

Morton, Thos., 65 Elizabeth, N. Y.

Samson Cordage Works, Boston, Mass.

Silver Lake Co., Boston, Mass.

Smith &amp; Egge Mfg. Co., Bridgeport.

**Sash Locks**

Fitch, W. &amp; E. T. Co., The, New Haven, Conn.

Ives, H. B. &amp; Co., New Haven, Conn.

**Sash Pulleys**

Fox Machine Co., Grand Rapids, Mich.

National Rapids Hardware Co., Grand Rapids, Mich.

Palmer Hardware Mfg. Co., Troy, N. Y.

**Sash Weights**

Barney &amp; Reed Mfg. Co., Boston, Mass.

Brown, E. E. &amp; Co., Philadelphia, Pa.

**Sausage Stuffers**

National Specialty Mfg. Co., Phila., Pa.

**Saws**

Atkins, E. C. &amp; Co., Indianapolis, Ind.

Bishop, Geo. H. &amp; Co., Cincinnati, Ohio.

Dixon, Henry &amp; Sons, Inc., Phila., Pa.

National Saw Co., Newark, N. J.

Simonds Mfg. Co., Pittsburgh, Mass.

**Saw Clamps**

Dixon, Henry &amp; Sons, Inc., Phila., Pa.

**Saw Guides**

Thompson Bros. &amp; Co., Lowell, Mass.

**Saw Handles**

Ladd, W. C., Bristol, Conn.

**Saw Sets**

Dixon, Henry &amp; Sons, Inc., Phila., Pa.

Taintor Mfg. Co., 9 to 15 Murray, N. Y.

**Saw Tools**

Atkins, E. C. &amp; Co., Indianapolis, Ind.

**Scales**

American Cutlery Co., Chicago, Ill.

Chatillon, John &amp; Sons, 35-39 Cliff, N. Y.

Chicago Seal Co., Chicago, Ill.

Pelouse Scale &amp; Mfg. Co., Chicago, Ill.

Standard Scale &amp; Supply Co., Pittsburgh.

**Scrap Metals**

Armstrong, R. S. &amp; Bro., Atlanta, Ga.

Blake, M. J. &amp; M., 10th Ave. and 15th St., N. Y.

Botger, C., Hoboken, N. J.

Greiner, F., Philadelphia, Pa.

Hittner, H. A. &amp; Sons, Phila., Pa.

Hoffeler, Theo. &amp; Co., Buffalo, N. Y.

Leonard, John &amp; Co., 22 Broadway, N. Y.

Miller, E. O. &amp; Co., Adrian, N. Y.

N. J. Iron &amp; Metal Co., Paterson, N. J.

Phillips, F. R. &amp; Sons Co., Phila., Pa.

Rogers, W. H., Bridgeport, Conn.

Samuels, M. Sons, Brooklyn, N. Y.

Smith, Morton B. Co., New York.

**Scrap Metal Breakers**

Birdsboro Iron &amp; Steel Breaking Co., Birdsboro, Pa.

**Scrapers, Road**

American Steel Scraper Co., Sidney, O.

Altman Co., Canton, Ohio.

Kilbourne &amp; Jacobs Mfg. Co., Columbus, Ohio.

Sidney Steel Scraper Co., Sidney, O.

Syracuse Chilled Plow Co., Syracuse, N. Y.

**Screens, Perforated Metal**

Harrington &amp; King Perforating Co., Chicago, Ill.

**Screens, Window and Door**

Daro, Edw. &amp; Sons, Philadelphia, Pa.

**Screw Cutting Dies**

Card, S. W. Mfg. Co., Mansfield, Mass.

Geometrie Drill Co., Westville, Conn.

Hogers, W. J., Mt. Boat Gauge &amp; Drill Wks., Gloucester City, N. J.

Wells Bros. &amp; Co., Greenfield, Mass.

Wiley &amp; Russell Mfg. Co., Greenfield, Mass.

Winter Bros., Wrentham, Mass.

**Screw Drivers**

Braunsdorf-Mueller Co., Elizabeth, N. J.

Brown, R. H. &amp; Co., New Haven, Conn.

Goodell-Pratt Co., Greenfield, Mass.

Mayhew, H. H. Co., Shelburne Falls, Mass.

North Bros. Mfg. Co., Philadelphia, Pa.

Sawyer Tool Co., Fitchburg, Mass.

Union Mfg. Co., Buffalo, N. Y.

**Screw Machine Products**

Dodge Machine Screw Co., Boston, Mass.

**Screw Machinery**

American Tool Wks. Co., Cincinnati, O.

Brown &amp; Sharpe Mfg. Co., Providence, R. I.

Costello, J. E. Mch. Wks., Brooklyn, N. Y.

Draper Mach. Tool Co., Worcester, Mass.

Garvin Machine Co., Springfield and Varick Sts., N. Y.

Jones &amp; Lamson Mch. Co., Springfield, Vt.

Windsor Mch. Co., Windsor, Vt.

**Screws**

Hall's Sam'l Sons, 230 West 10th St., N. Y.

Haskell, Wm. H. Mfg. Co., Pawtucket, R. I.

Machine

American Screw Co., Providence, R. I.

Blake &amp; Johnson, Waterbury, Conn.

Chicago Screw Co., Chicago, Ill.

Haskell, Wm. H. Mfg. Co., Pawtucket

Hubbell, Harvey, Bridgeport, Conn.

Illinois Screw Co., Chicago, Ill.

Miles, P. S., 305 Quarry, Philadelphia.

New Britain Hdw. Mfg. Co., New Britain, Conn.

Niagara Screw Co., Buffalo, N. Y.

Phila. Mach. Screw Works, Phila., Pa.

Pittsburgh Screw &amp; Bolt Co., Pittsburgh, Pa.

Reed &amp; Curtis Mch. Screw Co., Worcester, Mass.

Rhode Island Tool Co., Providence, R. I.

Worcester Mch. Screw Co., Worcester, Mass.

Wood

American Screw Co., Providence, R. I.

Franklin Moore Co., Winsted, Conn.

Reading Hardware Co., Reading, Pa.

Reading Screw Co., Norristown, Pa.

**Scroll Saws**

Barnea, W. F. &amp; John Co., Rockford, Ill.

Millers Falls Co., 38 Warren St., N. Y.

Seneca Falls Mfg. Co., Seneca Falls, N. Y.

**Scythe Stones and Whetstones**

Cleveland Stone Co., Cleveland, O.

Pike Mfg. Co., Pike Station, N. H.

**Seamless Steel Tubes**

Ivins Ellwood, 487 Broadway N. Y.

Janney, Steelmets &amp; Co., Phila., Pa.

National Tube Co., Pittsburgh, Pa.

**Sewing Machines**

Demorest Mfg. Co., Williamsport, Pa.

National Sewing Machine Co., Belvidere, Ill.

**Shafting**

Crescon, Geo. V. Co., Philadelphia, Pa.

Dodge Mfg. Co., Mishawaka, Ind.

Fairmount Mch. Co., Philadelphia, Pa.

Finished Steel Co., Youngstown, O.

Jones &amp; Laughlins Co., Pittsburgh, Pa.

Lockhart Iron &amp; Steel Co., Pittsburgh, Pa.

Pardee &amp; Works, Perth Amboy, N. J.

Pittsburgh Steel Shafting Co., Rankin, Pa.

Stow Mfg. Co., Binghamton, N. Y.

Woods, T. B. Sons, Chambersburg, Pa.

**Shaped Iron and Steel**

Allentown Rolling Mill, Allentown, Pa.

American Steel Hoop Co., Battery Park Building, N. Y.

American Steel &amp; Wire Co., Chicago, Ill.

Forest City Steel &amp; Iron Co., Cleveland, Ind.

Lindsay, W. W. &amp; Co., Phila., Pa.

Lockhart Iron &amp; Steel Co., Pittsburgh, Pa.

National Steel Co., Bridgeport, O.

Passaic Rolling Mill Co., Paterson, N. J.

Phoenix Iron Co., Phila., Pa.

Pittsburgh Steel Shafting Co., Rankin, Pa.

Republic Iron &amp; Steel Co., Chicago, Ill.

**Shapers**

Barker-Chard Mach. Tool Co., Cincinnati, O.

Gould &amp; Eberhardt, Newark, N. J.

Perkins Machine Co., Boston, Mass.

Potter &amp; Johnston Co., Pawtucket, R. I.

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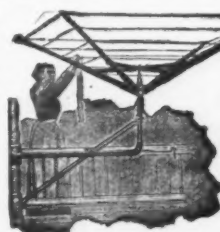
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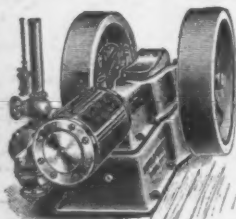
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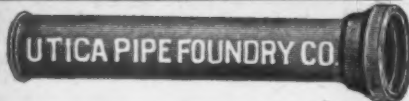
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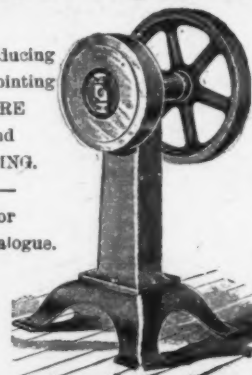


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